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The Review of Metaphysics

A PHILOSOPHICAL QUARTERLY

ARTICLES • CRITICAL STUDIES • DISCUSSIONS • NOTES
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On the Elements of Being: I

The Object of the First

Logical Constants, Part I

Problems to Contemporary

Man and Other English Problems

The Challenge of the History of Science: Part I

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Cartesian's Philosophy of Science

Part II: The

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ON THE ELEMENTS OF BEING: I

DONALD C. WILLIAMS

FIRST PHILOSOPHY, according to the traditional schedule, is analytic ontology, examining the traits necessary to whatever is, in this or any other possible world. Its cardinal problem is that of substance and attribute, or at any rate something cognate with this in that family of ideas which contains also subsistence and inherence, subject and predicate, particular and universal, singular and general, individual and class, and matter and form. It is the question how a thing can be an instance of many properties while a property may inhere in many instances, the question how everything is a *case* of a *kind*, a this-such, an essence endowed with existence, an existent differentiated by essence, and so forth. Concerned with what it means to be a thing or a kind at all, it is in some wise prior to and independent of the other great branch of metaphysics, speculative cosmology: what kinds of things are there, what stuff are they made of, how are they strung together? Although "analytic ontology" is not much practiced as a unit under that name today, its problems, and especially the problem of subsistence and inherence, are as much alive in the latest manifestoes of the logical analysts, who pretend to believe neither in substances nor in universals, as they were in the counsels of Athens and of Paris. Nothing is clear until that topic is clear, and in this essay ¹ I hope to do something to clarify it in terms of a theory or schema which over a good many years I have found so serviceable that it may well be true.

Metaphysics is the thoroughly empirical science. Every item of experience must be evidence for or against any hypothesis of speculative cosmology, and every experienced object must be an exemplar and test case for the categories of analytic ontology. Technically, therefore, one example ought for our present theme to be as good as another. The more dignified examples, however,

¹ It overlaps one read to the Philosophical Club of Boston University on December 3, 1952.

are darkened with a patina of tradition and partisanship, while some frivolous ones are peculiarly perspicuous. Let us therefore imagine three lollipops, made by a candy man who buys sticks from a big supplier and molds candy knobs on them. Lollipop No. 1 has a red round peppermint head, No. 2 a brown round chocolate head, No. 3 a red square peppermint head. The circumstance here which mainly provokes theories of subsistence and inherence is similarity with difference: each lollipop is partially similar to each other and partially different from it. If we can give a good account of this circumstance in this affair we shall have the instrument to expose the anatomy of everything, from an electron or an apple to archangels and the World All.

My chief proposal to that end may be put, to begin with, as nothing more tremendous than that we admit literally and seriously that to say that *a* is partially similar to *b* is to say that a part of *a* is wholly or completely similar to a part of *b*. This is a truism when we construe it with respect to ordinary concrete parts, for example, the sticks in the lollipops. On physical grounds, to be sure, it is not likely that any three solid objects, not even three sticks turned out by mass industry, are exactly similar, but they often look as if they were, and we can intelligibly stipulate for our argument that our exemplary sticks do exactly resemble each other through and through. To say then that each of the lollipops is partially similar to each other, that is, with respect to stick, is to say that there is a stick in each which is perfectly similar to the stick in every other, even though each stick remains as particular and distinct an individual as the whole lollipop. We would seldom give a proper name to a lollipop, and still more seldom to the stick in one, but we might easily do so—"Heraplem" for lollipop No. 1, for example, "Paraplete" for its stick, "Boanerp" for No. 2 and "Merrinel" for its stick. Heraplem and Boanerp then are partially similar because Paraplete and Merrinel are perfectly similar.

But what now of the rest of each lollipop and what of their more subtle similarities, of color, shape, and flavor? My proposal is that we treat them in exactly the same way. Since we can not find more parts of the usual gross sort, like the stick, to be wholly similar from lollipop to lollipop, let us discriminate subtler and

thinner or more diffuse parts till we find some of these which *are* wholly similar. This odd-sounding assignment, of course, is no more than we are accustomed to do, easily and without noticing. Just as we can distinguish in the lollipops Heraplem and Boanerp the gross parts called "sticks," namely, Paraplete and Merrinel, so we can distinguish in each lollipop a finer part which we are used to call its "color" and another called its "shape"—not its kind of color or shape, mind you, but these particular cases, this reddening, this occurrence or occasion of roundness, each as uniquely itself as a man, an earthquake, or a yell. With only a little more hardihood than christened the lollipops and sticks we can christen our finer components: "Harlac" and "Bantic" for the respective color components, let us say, and "Hamis" and "Borcac" for the respective shape components. In these four new names the first and last letters are initials of "Heraplem" and "Boanerp," and of "color" and "shape," respectively, but this is a mnemonic device for us, irrelevant to their force as names. "Harlac," for example, is not to be taken as an abbreviation for the description, "the color component of Heraplem." In a real situation like the one we are imagining, "Harlac" is defined ostensively, as one baptizes a child or introduces a man, present in the flesh; the descriptive phrase is only a scaffolding, a temporary device to bring attention to bear on the particular entity being denoted, as a mother of twins might admonish the vicar, "Boadicea is the cross-looking one." Heraplem and Boanerp are partially similar, then, not merely because the respective gross parts Paraplete and Merrinel (their sticks) are wholly similar, but also because the respective fine parts, Hamis and Borcac (their "shapes"), are wholly similar—all this without prejudice to the fact that Hamis is numerically as distinct from Borcac, to which it is wholly similar, and from Harlac, with which it is conjoined in Heraplem, as Harlac is from Bantic to which it is neither similar nor conjoined, and as the stick Paraplete is from the stick Merrinel, and as the whole lollipop, Heraplem, is from the whole Boanerp. The sense in which Heraplem and Boanerp "have the same shape," and in which "the shape of one is identical with the shape of the other," is the sense in which two soldiers "wear the same uniform" or in which a son "has his father's nose" or our candy man might say "I use the same ident-

ical stick, Ledbetter's Triple-X, in all my lollipops." They do not "have the same shape" in the sense in which two children "have the same father," or two streets have the same manhole in the middle of their intersection, or two college boys "wear the same tuxedo" (and so can't go to dances together). But while similar in the indicated respects, Heraplem and Boanerp are partially dissimilar in as much as their knobs or heads are partially dissimilar, and these are partially dissimilar because some of their finer parts, for example, Harlac and Bantic, their colors, are dissimilar.

In like manner, to proceed, we note that Harlac, the color component of No. 1 (Heraplem), though numerically distinct from, is wholly similar to the color component of No. 3. But No. 1 has not only a color component which is perfectly similar to the color component of No. 3; it has also a flavor component perfectly similar to the flavor component of No. 3. (It does not matter whether we think of the flavor as a phenomenal quality or as a molecular structure in the stuff of the candy.) The flavor-plus-color of No. 1 (and likewise of No. 3) is a complex whose own constituents are the flavor and the color, and so on for innumerable selections and combinations of parts, both gross and fine, which are embedded in any one such object or any collection thereof.

Crucial here, of course, is the admission of a "fine" or "subtle" part, a "diffuse" or "permeant" one, such as a resident color or occurrent shape, to at least as good standing among the actual and individual items of the world's furniture as a "gross" part, such as a stick. The fact that one part is thus finer and more diffuse than another, and that it is more susceptible of similarity, no more militates against its individual actuality than the fact that mice are smaller and more numerous than elephants makes them any the less real. To borrow now an old but pretty appropriate term, a gross part, like the stick, is "concrete," as the whole lollipop is, while a fine or diffuse part, like the color component or shape component, is "abstract." The color-cum-shape is less abstract or more concrete or more nearly concrete than the color alone but it is more abstract or less concrete than color-plus-shape-plus-flavor, and so on up till we get to the total complex which is wholly concrete.

I propose now that entities like our fine parts or abstract components are the primary constituents of this or any possible world, the very alphabet of being. They not only are actual but are the only actualities, in just this sense, that whereas entities of all other categories are literally composed of them, they are not in general composed of any other sort of entity. That such a crucial category has no regular name is quite characteristic of first principles and is part of what makes the latter worth pursuing. A description of it in good old phraseology has a paradoxical ring: our thin parts are "abstract particulars."² We shall have occasion to use "parts" for concreta and "components" for our abstracta (and "constituent" for both), as some British philosophers use "component" for property and "constituent" for concrete part. Santayana, however, used "trope" to stand for the *essence* of an *occurrence*;³ and I shall divert the word, which is almost useless in either his or its dictionary sense, to stand for the abstract particular which is, so to speak, the *occurrence* of an *essence*. A trope then is a particular entity either abstract or consisting of one or more concreta in combination with an abstractum. Thus a cat and the cat's tail are not tropes, but a cat's smile is a trope, and so is the whole whose constituents are the cat's smile plus her ears and the aridity of the moon.

Turning now briefly from the alphabet of being to a glimpse of its syllabary, we observe two fundamental ways in which tropes may be connected with one another: the way of location and the way of similarity. These are categorially different, and indeed systematic counterparts of one another—mirror images, as it were. Location is external in the sense that a trope *per se* does not entail or necessitate or determine its location with respect to any other trope, while similarity is internal in the sense that, given any two tropes, there are entailed or necessitated or determined whether and how they are similar. (What further this *prima facie* difference amounts to we cannot pursue here.) Location is easiest thought of as position in physical space-time, but I intend the notion to include also all the analogous spreads and

² I argued the general legitimacy of such a category in "The Nature of Universals and of Abstractions," *The Monist*, XLI (1931), pp. 583-93.

³ *The Realm of Matter*, Chapter VI.

arrangements which we find in different conscious fields and indeed in any realm of existence which we can conceive—the whole interior stretch and structure of a Leibnizian monad, for example. Both modes of connection are describable in terms of “distance” and “direction.” We are very familiar in a general way with the numberless distances and directions which compose locations in space and time, somewhat less familiar with the idea of what I suggest is the limiting value of such location (though very familiar with the phenomenon itself): the collocation, or peculiar interpenetration, the unique congress in the same volume, which we call “belonging to (or inhering in, or characterizing) the same thing.” With various interests and intentions, this nexus has been mentioned by Russell as “compresence,” by Mill as “co-inherence,” by G. F. Stout as “concrecence,” by Professor Goodman as “togetherness,” and by Whitehead, Keynes, and Mill again as “concurrence.”⁴ With respect to similarity, on the other hand, we are comparatively familiar with the notion of its limiting value, the precise, or almost precise, similarity such as obtained between the colors of our first and third lollipops, less familiar with the idea of the lesser similarity which obtains between a red and a purple, and rather uncertain, unless we are psychologists or phenomenologists, about such elaborate similarity distances and directions as are mapped on the color cone.

Any possible world, and hence, of course, this one, is completely constituted by its tropes and their connections of location and similarity, and any others there may be. (I think there are no others, but that is not necessary to the theory of tropes.) Location and similarity (or whatever else there is) provide all the relations, as the tropes provide the terms, but the total of the relations is not something over and above the total of the terms, for a relation R between tropes a and b is a constitutive trope of the complex $r'(a, b)$, while conversely the terms a and b will be in general composed of constituents in relation—though perhaps

⁴ See Russell, *Human Knowledge*, pp. 294, 297, 304, etc.; Stout, “The Nature of Universals and Propositions” (note 8 below); Nelson Goodman, *The Structure of Appearance*, p. 178; Whitehead, *Concept of Nature*, pp. 157-58; J. M. Keynes, *Treatise on Probability*, p. 385; J. S. Mill, *A System of Logic* (Longmans, 1930), p. 67. Mill is quoting Bain.

no more than the spread of a smooth or "homoeomerous" quale such as a color.

Any trope belongs to as many sets or sums of tropes as there are ways of combining it with other tropes in the world. Of special interest however are (1) the set or sum of tropes which have to it the relation of *concurrence* (the limiting value of location), and (2) the set or sum of those which have to it the relation of *precise similarity* (the limiting value of similarity, sometimes mischievously called "identity"). For a given trope, of course, one or both of these sets or sums might contain nothing except the trope itself, but it is hard to imagine a world in which there would not be many tropes that belong to well populated sets or sums of both sorts, and in our world such sets or sums are very conspicuous. Speaking roughly, now, the set or sum of tropes concurrent with a trope, such as our color component Harlac, is the concrete particular or "thing" which it may be said to "characterize," in our example the lollipop Heraplem, or, to simplify the affair, the knob of the lollilop at a moment. Speaking roughly, again, the set or sum of tropes precisely similar to a given trope, say Harlac again, is the abstract universal or "essence" which it may be said to exemplify, in our illustration a definite shade of Redness. (The tropes approximately similar to the given one compose a less definite universal.)

The phrase "set or sum" above is a deliberate hedge. A set is a *class* of which the terms are members; a sum is a whole of which the terms are parts, in the very primitive sense of "part" dealt with by recent calculi of individuals.^a In the accompanying figure, for instance, the class of six squares, the class of three rows, and the class of two columns are different from each other and from the one figure; but the sum of squares, the sum of rows, and the sum of columns are identical with one another and with the whole. What a difference of logical "type" amounts to, particularly in the philosophy of tropes, is far from clear, but



^a Nelson Goodman and Henry Leonard, "The Calculus of Individuals and Its Uses," *Journal of Symbolic Logic*, V (1940), pp. 45-55; Goodman, *The Structure of Appearance*, pp. 42 ff.; Appendix E, by Alfred Tarski, in J. H. Woodger, *The Axiomatic Method in Biology*, pp. 161-72.

everybody agrees that a sum is of the same type with its terms, as a whole is of the same type with its parts, a man of the same type with his arms and legs. The concept of a class or set, on the other hand, is notably more complex and questionable. A class is surely not, in any clear sense, what it is too often called,⁶ "an abstract entity," but there is some excuse for considering it of a different "type" from its members. Convinced that tropes compose a concretum in a manner logically no different from that in which any other exhaustive batch of parts compose it, we have every incentive to say that the concretum is not the set but the sum of the tropes; and let us so describe it. Whether the counterpart concept of the universal can be defined as the sum of similars—all merely grammatical difficulties aside—is not so clear. There is little doubt that the set or class will do the job. For all the paradoxes which attend the fashionable effort to equate the universal Humanity, for example, with the class of concrete men (including such absurdities as that being a featherless biped is then the same as having a sense of humor) disappear when we equate it rather with our new set, the class of abstract humanities—the class whose members are not Socrates, Napoleon, and so forth, but the human trope in Socrates, the one in Napoleon, and so forth. Still wilder paradoxes resulted from the more radical nominalistic device of substituting the *sum* of concrete men for their class,⁷ and most even of these are obviated by taking our sum of similar tropes instead. I suspect, however, that some remain, and because concurrence and similarity are such symmetrical counterparts, I shall not be surprised if it turns out that while the concurrence complex must be a sum the similarity complex must be a set.

In suggesting how both concrete particulars and abstract universals are composed of tropes, I aver that those two categories do not divide the world between them. It does not consist of concrete particulars in addition to abstract universals, as the old scheme had it, nor need we admit that it must be "constructible" *either* from concrete particulars *or* from abstract universals, as

⁶ Goodman, *op. cit.*, p. 150; W. V. Quine, *Methods of Logic*, p. 204.

⁷ Witness the doughty struggle of Quine and Goodman in "Steps Toward a Constructive Nominalism," *Journal of Symbolic Logic*, XII (1947), pp. 105-22.

recent innovators argue (Carnap and Goodman, respectively, for example). The notions of the abstract and the universal (and hence of the concrete and the particular) are so far independent that their combinations box the logical compass. Socrates is a concrete particular; the component of him which is his wisdom is an abstract particular or "trope"; the total Wisdom of which all such wisdoms are components or members is an abstract universal; and the total Socratesity of which all creatures exactly like him are parts or members is a "concrete universal," not in the idealistic but in a strictly accurate sense. It was because of the unfortunate limitation of ordinary philosophic discourse to the two combinations, concrete particular and abstract universal, that in order to call attention to our tropes we had to divert such phrases as "the humanity of Socrates" or "the redness of the lollipop," which normally would stand for kinds or degrees of humanity and redness, to stand for their particular cases of Humanity and Redness, respectively, and so we have been driven in turn to using the capital letters in "Humanity" and "Redness" to restore the "abstract nouns" to their normal duty of naming the respective universals. A similar explanation, but a longer one, would have to be given of our less definite phrases like "the shape of Boanerp" or "the color of it."

Having thus sorted out the rubrics, we can almost automatically do much to dispel the ancient mystery of predication, so influential in the idea of logical types. The prevalent theory has been that if y can be "predicated" of x , or "inheres in" or "characterizes" x , or if x is an "instance" of y , then x and y must be sundered by a unique logical and ontological abyss. Most of the horror of this, however, which has recently impelled some logicians to graceless verbalistic contortions, is due to taking predication as one indissoluble and inscrutable operation, and vanishes when our principles reveal predication to be composed of two distinct but intelligible phases. "Socrates is wise," or generically " a is φ ," means that the concurrence sum (Socrates) includes a trope which is a member of the similarity set (Wisdom). When we contrast a thing with a property or "characteristic" of it, a "substantive" with an "adjective," we may intend either or both of these connections. The particular wisdom in Socrates is in

one sense a "characteristic," i.e., it is a component, of him—this is the sense in which Stout held, quite properly to my way of thinking, that "characters are abstract particulars which are predicable of concrete particulars." ⁸ The universal Wisdom is in the second sense the "characteristic" of each such wisdom—this is the sense in which Moore could hold plausibly that even an event, such as a sneeze, *has* characteristics and is not one." In the third or ordinary sense, however, the universal Wisdom "characterizes" the whole Socrates. From this imbroglio emerge at least two senses of "instance," the sense in which Socrates is a (concrete) "instance" of Wisdom and that in which his wisdom component is an (abstract) "instance" of it, and the two notions of class, the ordinary concreta class consisting of Socrates, Plato, and all other whole wise creatures, and the abstracta class of their wisdoms, our similarity set.

Raying out around the problem of predication is many another half magical notion about essence and existence which we now can prosily clarify. Thus Mr. Broad and Mr. Dawes Hicks, while believing in "Abstracta," have described them in the same fantastic terms in which Santayana described his essences, as placeless and timeless, and hence "real but non-existent." ¹⁰ This remarkable but not unusual proposition might for a Platonist be grounded in a whole theory of universals *ante rem*, but mostly it results from not distinguishing between its two principal sources: the specious eternity a *universal* has because, as Stout put it, it

⁸ "Are the Characteristics of Particular Things Universal or Particular?" a symposium by G. E. Moore, G. F. Stout, and G. Dawes Hicks, *Proceedings of the Aristotelian Society*, Supplementary Volume III (1923), pp. 95-128 (p. 114). His theory of abstract particulars, here and in "The Nature of Universals and Propositions" (Hertz Lecture, *Proceedings of the British Academy*, Vol. X, 1922-23), is almost identical with the one I am defending; if there is a difference it is in his obscure idea of the class as a unique form of unity not reducible to similarity.

⁹ Loc. cit., p. 98. Mr. Moore, I cannot help thinking, already a very uncommonplace minion of the commonplace, almost fiercely resists understanding the Stout theory.

¹⁰ Broad, *Mind and Its Place in Nature*, p. 19; Dawes Hicks, *Critical Realism*, pp. 76-78. Broad can justly marvel that we can cognize what is mental or physical only by "cognising objects which are neither" (op. cit., p. 5).

"spreads undivided, operates unspent,"¹¹ which for us is just the fact that similarity is a "saltatory" relation, overleaping spatial and temporal distances undiminished and without cost in stuff or energy; and the specious eternity an *abstractum* has because in attending to it we normally "abstract from" its spatiotemporal location (which nevertheless it has and keeps). As the obscurity of Essence is thus mostly resolved by looking at it stereoscopically, to distinguish the dimensions of the universal and of the abstract, so too that dark mingling of glory and degradation which haunts Existence and the individual is mostly resolved by the ideas of concreteness and particularity. The Individual is hallowed both by the utter self-identity and self-existence of the particular occurrent and by the inexhaustible richness and the inimitability of the concrete. At the same time, however, it is debased by the very same factors. It seems ignobly arbitrary and accidental, *qua* particular, with respect to its mere self in its external relations, because it thus lacks the similarity, classification, and generalization which could interpret it; and it has the confusion and unfathomability of the concrete, wherein every form struggles in a melee of forms so stupendous that the Aristotelians mistook it for formless matter.

A philosophy of tropes calls for completion in a dozen directions at once. Some of these I must ignore for the present because the questions would take us too far, some because I do not know the answers. Of the first sort would be a refinement and completion of our account of substances and of the similarity manifold. Of the second sort would be an assimilation of the very categories of our theory—concurrence, similarity, abstractness, and so forth—to the theory itself, as tropes like the rest, instead of relegating them to the anomalous immunities of "transcendentals" (as the old Scholastics said) and "metalanguage" (as the new scholastics say). What in fact I shall do here is to defend the fundamental notion that there are entities at once abstract, particular, and actual, and this in two ways: the affirmative way of showing how experience and nature evince them over and over,

¹¹ "Are the Characteristics, etc.," p. 116.

and the negative way of settling accounts with old dialectical objections to them.

I deliberately did not use the word "abstract" to describe our tropes till we had done our best to identify them in other ways, lest the generally derogatory connotation of the word blind us to the reality of objects as plain as the sunlight (for indeed the sunlight is an abstract existent). The many meanings of "abstract" which make it repulsive to the empirical temper of our age suggest that an abstractum is the product of some magical feat of mind, or the denizen of some remote immaterial eternity. Dictionaries, journalists, and philosophical writers are almost equally vague and various about it. Santayana has it that "abstract" means imprecise, but also "verbal, unrealizable, or cognitively secondary."¹² The abstract is equated with the abstruse, the ethereal, the mental, the rational, the incorporeal, the ideally perfect, the non-temporal, the primordial or ultimate, the purely theoretical, the precariously speculative and visionary; or again with the empty, the deficient, the non-actual or merely potential, the downright imaginary, and the unreal. In some quarters "abstract" means symbolical, figurative, or merely representative, in contrast with what is real in its own right. On the same page the word may connote alternately the two extremes of precious precision and the vague, confused, or indefinite. Mathematics or logic is called "abstract" partly because it is about formal structures, partly because it treats them only hypothetically;¹³ but a symbolic calculus is called "abstract" because it isn't about anything. Semanticists and professors of composition shudder away from statements on such "high levels of abstraction" as "Herbivory is conducive to bovine complacency" in contrast with the "concrete" virility of "Cows like grass," though the two sentences describe exactly the same state of affairs. Logical philosophers proclaim their "renunciation of abstract entities" without making clear either what makes an entity "abstract" or how one goes about "renouncing" an entity.

One wonders, in view of this catalog, if there is anything which would not on occasion be called "abstract." Most people

¹² *Realms of Being*, p. 32.

¹³ C. I. Lewis, *Mind and the World-Order*, pp. 242, 249.

would deny that a cat is abstract, but an idealist would say she is. Yet it would be a mistake to infer that "abstract" has been a wholly indiscriminate epithet. All the uses we have observed, and doubtless others, have stemmed from two roots which in turn are related in a very intimate way. They represent what various persons believed, often mistakenly, is implied by those root ideas. One of them is the use of "abstract" to mean *transcending individual existence*, as a universal, essence, or Platonic idea is supposed to transcend it. But even though this use of "abstract" is probably as old as the word itself, I think it was in fact derived, by the natural mistake which we earlier noted, from the other aboriginal use, more literally in accord with the word's Latin construction, which is virtually identical with our own. At its broadest the "true" meaning of "abstract" is *partial, incomplete, or fragmentary*, the trait of what is less than its including whole. Since there must be, for everything but the World All, at least something, and indeed many things, of which it is a proper part, everything but the World All is "abstract" in this broad sense. It is thus that the idealist can denounce the cat as "abstract." The more usual practice of philosophers, however, has been to require for "abstractness" the more special sort of incompleteness which pertains to what we have called the "thin" or "fine" or "diffuse" sort of constituent, like the color or shape of our lollipop, in contrast with the "thick," "gross," or chunky sort of constituent, like the stick in it.¹⁴

If now one looks at things without traditional prepossessions, the existence of abstracta seems as plain as any fact could be. There is something ironically archaic in the piety with which the new nominalists abhor abstract entities in favor of that "common-sense prejudice pedantically expressed,"¹⁵ the dogma of Aristotle that there can be no real beings except "primary substances,"

¹⁴ Although this has been for centuries the root meaning of "abstract," the nearest to a straight-forward statement of it which I have found is by Professor Ledger Wood in the *Runes Dictionary of Philosophy*, 1942, p. 2: "a designation applied to a partial aspect or quality considered in isolation from a total object, which is, in contrast, designated concrete." Even here the word "isolation," as we shall see, is delusive.

¹⁵ Russell, *History of Western Philosophy*, p. 163.

concrete individuals, as absolute and "essential" units, and thus turn their backs on one of the greatest insights of the Renaissance, that the apparent primacy of such chunky middle-sized objects is only a function of our own middle size and practical motivation. The great modern philosophies have rather sought the real in putative "simple natures" at one end of the scale and the one great ocean of action at the other end. I have no doubt that whole things like lollipops, trees, and the moon, do exist in full-blooded concreteness, but it is not they which are "present to the senses,"¹⁶ and it is not awareness of abstracta which is "difficult, . . . not to be attained without pains and study."¹⁷ To claim primacy for our knowledge of concreta is "mysticism" in the strict sense, that is, a claim to such acquaintance with a plethoric being as no conceivable stroke of psychophysics could account for. What we primarily *see* of the moon, for example, is its shape and color and not at all its whole concrete bulk—generations lived and died without suspecting it had a concrete bulk; and if now we impute to it a solidity and an aridity, we do it item by item quite as we impute wheels to a clock or a stomach to a worm. Evaluation is similarly focussed on abstracta. What most men value the moon for is its brightness; what a child wants of a lollipop is a certain flavor and endurance. He would much rather have these abstracta without the rest of the bulk than the bulk without the qualities. Integral to the debate between the metaphysical champions of the concrete particular and of the abstract universal has been a discussion whether the baby's first experiences are of whole concrete particulars (his ball, his mother, and so forth) or of abstract universals (Redness, Roundness, and so forth). For what it may be worth, perhaps not much, a little observation of

¹⁶ I have in mind Willard Quine's epistemological ballad about *Homo javanensis*, whose simple faculties "could only treat of things concrete and present to the senses." "Identity, Ostension, and Hypothesis," *Journal of Philosophy*, XLVII (1950), pp. 621-33 (p. 631 n.).

¹⁷ This is Berkeley on abstract ideas, *Principles*, Introd., Sect. 10. It is cited at length by James, *Psychology*, Vol. 1, p. 469, who argues, correctly I think, that what is difficult is not the recognition of abstracta but the recognition that they are abstract, and the conception of the universal, and that these are at worst no more laborious than the counterpart conception of the concretum.

a baby, or of oneself in a babyish mood, will convince the candid and qualified that the object of such absorption is not the abstract universal (the infant does not "fall from the clouds upon the topmost twig of the tree of Porphyry")¹⁸ and certainly not the concrete particular (that "foreign thing and a marvel to the spirit"¹⁹ which a lifetime of observation and twenty centuries of research hardly begin to penetrate), but is in sooth the abstract particular or trope, *this* redness, *this* roundness, and so forth.

Though the uses of the trope to account for substances and universals are of special technical interest, the impact of the idea is perhaps greater in those many regions not so staled and obscured by long wont and old opinion and not so well supplied with alternative devices. While substances and universals can be "constructed" out of tropes, or apostrophized *in toto* for sundry purposes, the trope cannot well be "constructed" out of them and provides the one rubric which is hospitable to a hundred sorts of entity which neither philosophy, science, nor common sense can forego. This is most obvious in any attempt to treat of the mind, just because the mind's forte is the tuning, focussing, or spotlighting which brings abstracta into relief against a void or nondescript background. A pain is a trope *par excellence*, a mysterious bright pain in the night, for example, without conscious context or classification, yet as absolutely and implacably its particular self as the Great Pyramid. But all other distinguishable contents are of essentially the same order: a love, or a sorrow, or "a single individual pleasure."²⁰

The notion, however, gets its best use in the theory of knowledge. The "sensible species" of the Scholastics, the "ideas" of Locke and Berkeley, the ideas and impressions of Hume, the sense data of recent epistemology—once they are understood as tropes, and as neither things nor essences, a hundred riddles about them dissolve, and philistine attacks on theory of knowledge itself lose most of their point. We need not propose that a red *sensum*, for

¹⁸ Brand Blanshard, *The Nature of Thought*, Vol. I, p. 569.

¹⁹ Santayana, *The Unknowable* (Herbert Spencer Lecture), p. 29.

²⁰ C. S. Peirce, without the notion of trope, denounces this perfectly intelligible phrase as "words without meaning," *Collected Papers*, Vol. I, p. 172.

example, is perfectly abstract (whatever that might be). But even though it have such distinguishable components as a shape and a size as well as a color, and though the color itself involve the "attributes" of hue, brightness, and saturation, still it is abstract in comparison with a whole colored solid. According to reputable psychologists, furthermore, there can be data much more abstract, professed "empiricists" to the contrary notwithstanding: data which have color and no other character, or even hue and no other "attribute." The person who uses the theory of tropes to sharpen his sight of what really is present and what is not may not credit such still more delicate components, attributed to the mind, as the imageless thought of the old German schools, or the non-imaginal ideas of Descartes, or the pure concepts of the Scholastics, or the ethereal Gestalten of more recent German evangelists; but if any of these do exist, they exist as tropes. The same is to be said, I suppose, of the still darker categories of pure mental act, intentionalities, dispositions, and powers. Such actual but relatively complex mental processes as trains of thought, moral decisions, beliefs, and so forth, taken as particular occurrents, whether comparatively brief or lifelong, and not (as nearly all phrases in this department at least equally suggest) as recurrent kinds, are tropes and compounded of tropes—and the kinds too, of course, are compounds of tropes in their own way. A whole soul or mind, if it is not a unique immaterial substance on its own, is a trope.

(To be concluded)

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THE OBJECT OF THE POEM¹

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I

LET us ask what status in being can be assigned (in A. C. Bradley's usage of the term) to the poem's "substance," or to that which the poem is about or, as I shall call it in this essay, to its object. What we are asking is whether the object of the poem can be said to "exist" or has to be assigned some other status in being. But let us note first that the question we are asking falls within the field of poetics, or the aesthetics of poetry, which is a sub-division of aesthetic inquiry. Limited as it is, however, it is not unreasonable to suppose that most of its conclusions may be applicable, with appropriate changes, to the other arts.

In order to answer our question, "What is the object of the poem?" we must consider two stages of the coming to be of the poem. This is what unqualified organicists forget. The first stage discloses what is called by A. C. Bradley the "subject matter of the poem." It shows the subject matter to consist of the objects of non-aesthetic experience, with whatever structure they may inherently possess as appropriate to their natures, which the poet employs in the making of his poem. These objects can be classified by the philosopher of culture into four main categories: the cognitive, the aesthetic, the moral, and the religious. The reason for including aesthetic objects as possible stuff which makes up the subject matter of the poem is the fact that the artist sometime uses finished poems in the same way in which he uses the rest of his experience, as when a Shakespeare, a Goethe, or a Marlowe employs old poetry to make new.

The second stage in the coming to be of a poem discloses the

¹ The word "poetry" is used in this paper in its widest acceptance. The paper itself is a revised version of part of the second of two *Mahlon Powell Lectures*, given at Indiana University on 22 and 24 July 1952.

finished poem. Bradley designates what the poem is about at this stage as "the substance of the poem," and I often refer to it as "the informed substance" to mark by means of pleonastic emphasis the fact that the subject matter has been transubstantiated in the creative act. "The substance" of the poem is not rendered directly but symbolically; when a poem is about love or grief or the evil or the glory of men it does not point to actual value but to symbolized value. But what the symbols refer to, the informed substance of the poem, and the subject matter employed in its elaboration, both possess, or at least so I assume in this inquiry, some sort of status in being. The question to which we seek an answer is, "What is the status in being of the informed substance of the poem?"

Back of these assumptions there stand a few methodological principles and a number of substantive commitments suggested by the exigencies of a philosophy of culture, one or two of which it is desirable to sketch succinctly. It is assumed, first, that the purposes for which we discriminate things or events and their inter-relations are many, and the objects which we thus select to focus awareness on, and the psychological processes of discrimination, differ with these purposes. Thus, a phenomenological analysis of the modes of experience (without which, of course, there can be no rational grasp of the structure of experience as it is embodied in culture) carried on with a view to an exploration of the components of culture, distinguishes three other modes besides the aesthetic—the cognitive, the moral, and the religious. Each one of these modes grasps an object which is appropriate to it and which can be defined independently of the mode that grasps it, since it embodies traits peculiar to the object that determines that mode. Since, however, we may assume that there is, generically speaking, a fixed relationship between object and mode, it is possible, and there are occasions when it is desirable, to define the object in terms of the mode. Thus approached, those objects that are the end of any other than the aesthetic mode are, in Dewey's convenient terminology, merely *recognized*, not *perceived*.²

² John Dewey, *Art as Experience* (New York, 1934), pp. 52 ff.

On this usage, "perception" and "aesthetic perception," are synonymous terms. And it follows that ordinary objects, which is to say, objects recognized as what they are for non-aesthetic purposes, are not grasped in their full individuality and uniqueness, and that if we are to grasp them in their individuality we must grasp them aesthetically. While, however, it is desirable to mark off various modes of experience, the analytic discrimination of these modes ought not to prejudice two independent questions: whether, or to what extent, we can actually undergo pure modes of experience; and whether, if we can actually undergo such pure modes, they are as valuable as mixed modes. These are not questions that can be answered on this occasion. But we should not forget that it is essential to answer them if we are to gain a complete understanding of the role that art plays in the creation of culture.³

³ It would seem that all experience, whether outwardly or reflectively addressed, and whether moral, aesthetic, or religious, includes as one of its components a cognitive element, since it involves the more or less clear awareness or discrimination of an object proper to the interest that arouses in the responding mind its dynamic thrust. And it seems probable that all actual experience includes also a moral, an aesthetic, and even perhaps a religious component. We know from anthropology and from history that cultures display a tendency to subordinate and even to exclude the role played by some of these modes and to emphasize others. However, it seems that all experience involves a moral component, since it is purposive, except perhaps in those cases in which the subject loses control of himself and stands bewildered and baffled by what appear to him to be unpatterned events; and as purposive, experience is guided by operative values more or less clearly discernible prior to action, which give it a moral dimension. All experience, it would also appear, involves an aesthetic component, since the act of discrimination of an object or a situation is addressed, if the experience is to achieve completion, to a more or less intransitive apprehension of the object or situation of awareness as a self-sufficient object which is immanently significant. And I also believe that, whether we acknowledge it or not, all experience has a religious component, however recessive, since it discriminates objects which are never in fact unrelated to the total constellation of objects of experience, although in the aesthetic mode of apprehension they appear to be self-sufficient. Reflection, dramatic or technical, discloses the totality of experience to be worthy of a mode of response on our part which is essentially religious. The internal dialectic of our wonder about the origin of the objects of experience and about the values which give experience substance, and the structures which inform it, pushes us, or, rather, pushes those of us who

Whatever the answers that we give to these two questions, it is assumed that the aesthetic object is grasped intransitively as a unique individuated object which is, for perception, self-sufficient.⁴ It is also assumed that the aesthetic response is possible because the object of art as a public object—or, what is the same thing, as one of the components of culture—is a contrived whole, which embodies symbolically meanings and values in a fully integrated and structured manner, and is thus so ordered as to constitute a self-sufficient, coherent, and congruous complex datum, available through a distinctive mode of apprehension, which exhibits it as the unique object that it is.⁵ What most obviously distinguishes other kinds of aesthetic objects from poems is of course the linguistic medium. But the medium limits the meanings and the

are bold and free from methodolatrous shackles, and who are concerned with the relation of man to culture, and of both to the universe, out beyond the rim of the positively knowable into areas which fall within the purview of metaphysics and theology.

⁴ See my "A Definition of the Aesthetic Experience," *The Journal of Philosophy*, XXXIV, pp. 628, 634; and "A Natural History of the Aesthetic Transaction," in *Naturalism and the Human Spirit*, ed. Y. H. Krikorian (New York, 1944), pp. 96-120. The definition of the aesthetic experience to be found in these papers is valid at the phenomenological level, although the metaphysic or, rather, lack of metaphysic, on which they are built is to be deplored.

⁵ The term "meanings" is used elliptically for "the meanings of a community," in the sense in which, as I take it, some anthropologists use this locution to refer to the structure of the institutionalized arrangements and processes of social life which embody such values as are operative in a community. It is these meanings and the values they sustain that the poet observes consciously or unconsciously and imports, in A. C. Bradley's term, as "subject," into the creative act. A society whose meanings and values are not grasped dramatically is lacking in the human dimension, is blind to the import of its destiny. It is these meanings and values that Robert Redfield, if I understand him, calls "social relations," which of course make possible, from a sociological point of view, the flourishing of a culture. Cf. *The Folk Culture of Yucatan* (Chicago, 1941), p. 13. As here employed the term "culture" refers to the interrelated constellation of activities of a social group, insofar as these activities, the social institutions through which they are carried on, and the physical instrumentalities that make them possible, embody values that enable the group to maintain itself as a purposive, distinctively human society; the meanings are the social structures as value carriers; the culture is the total pattern of values carried in the meanings. I hold that it is the poet's unique function to discover the meanings and values of a society through the act of creation.

values which can be embodied in the poem. Structure, or form, or order, or organic interrelatedness, then, of diverse component meanings and values conveyed by means of linguistic symbols, which criticism can discover in the poem, and self-sufficiency and intransitivity, which have their ground in that order, are the factors which make the poem possible. There are, of course, others; but these are, for our purposes, the only ones that need be mentioned.

It is finally assumed that the question we are interested in cannot be answered in psychological terms. Aestheticians have frequently recorded the fact that intercourse with art sometimes produces an overwhelming feeling of reality. Our soul, to use an expressive phrase of William James, "sweats with [the] conviction" that in the object of our aesthetic attention we have at last come upon the really real. Different men seem to get this kind of feeling from different arts. Some obtain it from music and others from poetry, while still others may derive it from painting or sculpture. But if we compare what they say about their experiences, we conclude that it is very much the same in any art. L. A. Reid puts it very clearly:

And often it will happen in this harmonious satisfaction of our profoundest impulses we feel a tremendous conviction of knowledge, which is accompanied sometimes by a sense of the superiority of such knowledge to other forms of it. Our conviction is closely akin to the convictions of the mystic In such moments the riddle of existence seems to be solved; we experience the perfect moment; we "feel" intensely "real"; and, feeling so, we feel also that we are intuiting objective reality, as it were, from the inside.⁶

We need not question, of course, that the feeling occurs. But whether art gives us knowledge, whether that knowledge is about reality or about phenomena, and whether it is a superior kind of knowledge to that which we have of familiar objects, or to that which the physicist has of the structure of the physical world—these are not questions the philosopher would decide by appealing to the feeling of the amateur as evidence. If the intensity of the amateur's conviction of the objective reality of art were acceptable as evidential, hallucinations and apparitions that are the effects of drugs would be more real than the objects of our workaday world.

⁶ L. A. Reid, *A Study in Aesthetics* (New York, 1931), p. 251.

In an obscure paper published over fifteen years ago I analyzed in psychological terms how the amateur arrives at the intense conviction he derives from art.⁷ The conviction or feeling of reality, I argued, following close on the steps of William James, is a by-product of the manner in which an object of art excludes from consciousness everything else but itself. The exclusion is made possible by the unification achieved by the artist of all discriminable aspects of the object which he offers to us for intransitive apprehension. The amateur's intense feeling, then, is no ground on which to argue that we are here presented with a superior reality. The psychological explanation of the amateur's feeling, therefore, fails to throw light on the question to which we want to turn.

II

Since there are today many thinkers who hold that the question we have posed need not legitimately arise, let us review the grounds on which we must assert that there is a distinction between the poem, its linguistic vehicle, and its object. A poem is a special kind of linguistic thing. Language is able to point to actual things in the world and to purely intelligible or ideal things and to fictions, all of which have some sort of status in being independently of the language by means of which we point to them. Let us call this function of language its "ostensive function." What the locution means is that the object to which the language refers is external to the language and independent of it. It follows that the object of ostensive language can be referred to in various synonymous expressions in the same language and in several tongues without loss, although not necessarily with the same economy and elegance. The objects to which ostensive language refers may be real, or ideal, or fictitious, but whatever they are, they are external to the language by which I point to them and in a sense can be exhibited independently of it, since they can be exhibited in a large number of different languages. And this holds irrespective of what status in being we may finally

⁷ "Reality in Art," *The University Review*, IV, No. 1 (1937), pp. 36-42.

assign to them at the conclusion of our ontological inquiries. I may not be able to tell you exactly what status in being they have, but that they have some I know. It may be retorted that fictions of any kind, including poetic ones, have no status in being whatever, since contemporary philosophy has devised techniques that enable it to make a clean sweep of all such pseudo-entities. But this criticism would miss the point we are seeking light on, namely, that whether we call them pseudo-entities or imaginary, or ideal, entities, or anything else we choose, the fact remains that the object of poetry differs in an important respect from other objects to which language refers.

The language of poetry is not ostensive; the object it reveals has no discoverable existential status independent of the language that reveals it—it has no status in space and time. What reason have we, then, to say that poetry reveals an object and that this object has some sort of status in being? What grounds have we for asserting that the language of the poem is not identical with its object? Unless good grounds are produced, there is a justified suspicion that we may be asserting a distinction without a difference. This is what those who fear, as they put it, the proliferation of metaphysical entities and of realms of being, or of ontological levels or modes of reality, would assert. They argue that the assumption that the content of poetry, or as we are calling it, its object, can have any other than the existential status, is metaphysical nonsense. What are the reasons for asserting that poetry has an object and that this object has some sort of status in being distinct from the language of the poem? The first of these questions is not difficult and I shall try to answer it below. But the question as to what is the status in being of that object is indeed one of the most difficult questions that a philosopher could ask. I shall answer it here in a dogmatic manner. I hope that the edge of the dogmatism will be blunted by the fact that I have already discussed it elsewhere, where I have tried to adduce what arguments I was able to muster in favor of my position.*

* I have argued it for moral values in *The Moral Life and The Ethical Life* (Chicago, 1950), and the arguments hold for aesthetic value; and I

The reason we must distinguish the language of the poem from the object it reveals is that the question, "What is the poem about?" is not only an intelligible question but one to which a partial answer can be given. We can supply a paraphrase of the poem. The paraphrase is not the object and cannot exhaustively point to it; it is merely a means by which a reader can be helped to find the object. Further, of two paraphrases we can say that in certain respects one comes closer to revealing what the poem is about than the other. But while the paraphrase points to that aspect of the object that is revealed *through* the poem, it does not help us discover that aspect which is revealed *in* the language itself. The language of the poem reveals the object in itself, by means of its character as language, in the sense that the values and meanings which constitute the object of the poem are conveyed to the reader as what they are *in* or *by means of* its prosodic character and the felt morphological structures which make up the poem. That this is the case is not possible to demonstrate to anyone who does not know how to read poetry and it needs no demonstration for anyone who does. But this need cause us no astonishment, since it would be equally impossible to give a congenitally blind man an idea of the world of vision. We know, as we progress in our skill in the reading of poetry, that we have deepened our grasp of the poem. It is a question of a more lucid yet untranslatable grasp of objective meanings and values. In any case, for some reason that has so far resisted all effort to elucidate it (at least within the range of my reading) somehow the linguistic medium, both through its analytically discriminable elements and considered as an organic whole, helps to convey or reveal the values and meanings which are embodied in the poem and which constitute its object. The most obvious illustration of this fact is found in onomatopoeia, in which some aspects of the intended object are revealed in the phonetic properties of the linguistic medium. But this is only one, and a relatively unimportant way, in which the object is revealed in the language itself.

Another reason we must distinguish the language of the poem

summarize the argument in an essay entitled "The Nature of Aesthetics," in *The Return to Reason*, ed. by John Wild (Chicago, 1953), pp. 203-207.

and its object emerges when we consider what is involved in the poet's creative effort. The intentional direction of his mind is two-pronged; it is addressed to a search for the appropriate word or phrase and for what he wants to say, for the object. The language sought must fit the object. But the object is not discovered until the language is found. What is meant by the word "fit" we cannot here adequately explore without going far afield. Let us be content with noting that the relation to which the word refers is as readily evident to the trained reader as it is to the poet. It is not difficult to find synonyms for the term, but they no more explain the relation than the word "fit" does. We can say there is a "harmony" or a "congruity" between the language and the object of poetry. And we can even advance a short step and say that the relation of fitness obtains when the object has been grasped with lucidity and finality—which is to say, when a complete revelation has taken place. But whether a revelation takes place or not is something only a trained reader can tell, and he only by direct inspection. So many variables enter into the discrimination of what the poem is about that consensus as to whether the language reveals its object in a fitting manner or not is something to be prayed for but not to be expected as an ordinary occurrence. But whatever procedure is involved in reading a poem and whatever criteria is agreed on in deciding whether the poem reveals its object fittingly, we must finally come to rest on the ability of the reader to discover what it reveals, and this is an ineluctable datum which aesthetic speculation cannot circumvent.

An allusion to a commonplace of critical theory may throw some light on what is meant by the fitness between the language of poetry and what it is about. We often speak of the poet's honesty. And one of the things we have in mind is that he must successfully resist the lazy tendency to sacrifice the revelation of the object by falling back on ready-made linguistic forms—on stereotypes of imagery or of prosody; he must also successfully resist the tendency to sacrifice the language to a ready-made conception of the object. When he yields to these tendencies "fitness" is lacking. The poet sacrifices language to object—and thus sacrifices his object as well—when, for instance he fails to realize in it the object because the words or the numbers obscure it in some way or other. He

sacrifices the object to the language, and thus he also sacrifices the language, when, for instance, he is overwhelmed, as critics say, by passion. In either case what he does is sacrifice the poem. Between two linguistic constructions which to the non-creative ear may seem to be almost identical, the poet chooses one because he feels that it comes closer than the other to what he wants to say. But not until the one that fits satisfactorily is found does he feel that his job is done. In short, his sense of language and his sense of something other than language, control the poet's choice of language. The creative process thus involves a search for language that adequately captures in and through itself the object that, somehow, until it is successfully captured by language, lies tantalizingly just beyond the reach of consciousness. It is the task of the aesthetician to do justice to this phenomenon in its full complexity, not to explain part of it by explaining away or ignoring another part of it. This is the reason that so-called formalist aesthetics and the aesthetics of imitation, as the latter is usually interpreted, fails to satisfy us. The theory of imitation must be rejected by anyone who grasps firmly the difference between existential objects and the objects of poetry. Formalism must be rejected by anyone who grasps the fact that poetry "means something," even if the expression I have put between quotes is not much more than an unfortunate muddle which is thickened when we try to explain it by saying that art means itself or that a presentational symbol merely presents itself, and thus does not represent.

III

Let us, at last, turn to our question and ask, "What status in being has the object of the poem?" Reflection soon reveals the ambiguity of the question. I may refer to the object of the poem prior to its revelation in language, during the time that language imprisons it and, in view of the effects of the poem on culture, later, after the poem is no longer an object of aesthetic interest but becomes one of the forces that shapes culture. Prior to its embodiment in poetry we discover that the object of the poem has two different positions: in respect to culture, at any time, it may be

found prefigured in it but so embedded and so inchoately realized, and insofar as it is at all realized, so little grasped at the conscious level by the members of the culture as to be, for them, practically non-existent. Insofar as the object is already realized the poet merely imitates—he is a reporter and not a poet. He is a poet only when his creative activity discloses values and meanings which the culture is ready to espouse and adopt, which are knocking, so to speak, at the gate of history, seeking admission, or have surreptitiously entered history and become operative in the culture, but have not yet been identified, revealed, given a name and a dramatic mask.

In the latter case—and this is the case in which a man exploits his poetic ability to the maximum—the object of the poem totally *subsists* prior to its embodiment. In the former case, the object is still in a semi-subsistent state, not fully existent, or to the extent that it is actually realized in the culture, it is not recognized as such. To the extent that the object has been fully grasped by the culture prior to embodiment in a particular poem (and that grasp is, I would hold, always, in its first instance, an aesthetic grasp), the object of the poem is an object of mere imitation and therefore of low poetic value. The poet's gift consists in discovering the not-yet-discovered subsistent values and meanings that make up his poem's object in the creative act which is the revelation of that object in and through the language to his own and to his reader's minds. In any case, when the poet, through his creative gift captures an object in and through the language of the poem, the object does not, by virtue of such capture, enter into existence. It has what status it may have, in respect to the poetic revelation it is the object of, in the poem; and because it is desirable to identify this status I shall say it *insists in* the language, although the use of the preposition, dictated, unless I am mistaken, by the exigencies of the idiomatic genius of the language, is somewhat pleonastic. The poem itself *exists* as an object of culture, although ideally, since it is to be found in a book to be read or to be explicated by the critic, or found in a man's mind to be recited, or set to music. But the object of the poem as distinct from the poem itself no longer merely subsists, in the sense that it did prior to its discovery through the creative act. This is my excuse for adopting a bar-

baric neologism and saying that it *insists*. Insistent objects are ideal objects, revealed in and through the language of poetry, and poetic revelation may be called, if we desire, a kind of representation or imitation—but one which takes place not merely through but in the language and represents or imitates objects which until they were captured by the poet were hidden in the limbo of subsistence. It ought to be observed, however, that to call poetic revelation a kind of representation or imitation is a very poor way of saying what is intended. But it is one to which traditionalists are loyal, and one which cannot be legitimately objected to so long as it is merely a verbal expression and does not suggest similarities between what is imitated or represented and what does the imitation, and insofar as it does not obfuscate the fact that what is imitated or represented does not exist but subsists.

Insofar as the objects of poetry subsist prior to their revelation, they have the same status, for ontology, as is enjoyed by the operative invariant relations in nature—the “forces” and “powers” and the actualizing potencies which subsist as the structures of the physical world and which the scientist “discovers” and formulates as his “laws.” But we must not forget the all-important difference between the objects expressed through the scientific hypothesis and the objects revealed through and in poetry.

If circumstances conspire, the poem performs effectively its practical role in culture: the values are isolated from the poem and espoused, and the meanings are institutionalized and thus given actuality in men's actions. When this takes place they are no longer dependent on the language in which the poet revealed them, and ostensive language can now refer to them. We can speak of Trojan horse tactics, of a man's quixotism; we speak of a man we know as a Don Juan or a Hamlet; we refer to the vices of a person of our acquaintance as those of a Karamazov, and the infatuation of a lad as that of a Romeo. But as actualized in culture, the values and meanings which constitute the object of poetry are not identical with their insistent revelation in poetry. A historically valorous act inspired by a reading of the Iliad, let us say, or the quixotical character that a man of flesh and bone may happen actually to have, is never in an unqualified sense like the valor or the quixotism revealed in a poem. When the insistent

values and meanings presented in and through poetry are by some happy chance actualized in existence, they gain, if "gain" it may be called: they now have temporality and spatiality. But they lose in specificity and in uniqueness at least for ordinary perception, since they become entangled in irrelevant and obtrusive factors which rob them of their distinct boundaries and which in fact impede their actualization to the full. Whether the change from subsistence to existence is a gain or a loss, however, is something on which the doctors disagree. The majority of our contemporaries, loyal inmates of a secularistic culture, are certain that it represents a gain. Plato and many others have considered it a distinct loss.

IV

It is desirable to summarize succinctly the import of the preceeding remarks before bringing our discussion to a close. I have said that the poem is a linguistic thing which reveals symbolically in and through its medium meanings and values which have subsistent status in being and which are discovered by the poet in the act of creation. Note that the word "discover" is intended literally, for the meanings and values embodied in the poem do not exist prior to their embodiment. They are found by the poet in the creative act, in a realm beyond existence where they subsist. What the poet embodied is not altogether unrelated to his cultural and idiosyncratic experience, and to his poetic training and interests.

Once a poem is assimilated individually or culturally, its readers get the impression that its object imitates meanings and values with which they have been more or less well acquainted all along. But this is an illusion. For the values and meanings of a culture are never known, or never known clearly, or never known in their full density and specificity by those who participate in the culture, until the poem reveals them. When it does so, the symbolic revelation exercises, by virtue of the requiredness possessed by the revealed values, a normative function which leads men to espouse them and to realize them in culture.

Thus, at least at the phenomenal level, the object of the poem

is objective, since it is revealed in and through the poem which, being an object of culture, contributes to the culture its meanings and values as potentially operative factors in it. This complex activity through which the poet extricates meanings and values by means of the creative process and gives them to his people who, now, through his formulation of them, are able to use them as ideal patterns of experience, is precisely the activity through which the gradually discovered ideals of the society are first defined and finally actualized, to some extent, at least, in institutions. Only then do they achieve their maximum of effective power in determining the quality of life of men and the direction of their historical development. Because poetry exercises an influence on the values actualized in a culture it has a normative function to perform. Thus to the extent that the poet succeeds in revealing meanings and values which are actually involved in an emergent sense in the social process, he becomes the creator of culture and the meanings and values thus revealed become constitutive of culture.

The object of the poem, then, has more than a merely phenomenal objectivity. It has status in being, or as I would put it, "ontic status," since the meanings and values revealed in and through the poem subsist by themselves and are actually to some extent at least operative in the culture prior to their discovery by the poet. There is thus a double connection between poetry and existence. It is this double connection that defines the function that poetry performs.

Because an elucidation of the arguments through which we could justify the contention that the structure and the values of a culture have ontic status would take us far from the field of aesthetics and because I have attempted it elsewhere, I have here assumed it, although I know perhaps as well as any man of my generation that the doctrine of axiological realism is profoundly revolting to the dominant philosophical fashion of our age, at least in the Anglo-Saxon world.* Without attempting to do again what

* This prejudice is not as generally shared by European thinkers as it is by Americans. For instance, Herman Weyl in *Symmetry* (Princeton, 1952), pp. 6-8, tells us: "Did the artist discover the symmetry with which nature according to some inherent law has endowed its creatures,

I have done elsewhere, let us note, in passing, that the ostensive reasons for this deep-seated repugnance never quite do justice to the depth of the feelings involved. The best reason that is offered seems to be that on methodological grounds philosophers of science have shown that there is no need of any other type of entities than existent ones and that existence, outside the reach of human desire and need, is free of values and of purposive structures. But philosophers of science could not have shown any such thing. What they could have shown, at most, is that *for their purposes* there is no need for positing anything else than existents. To argue more than this is to assume that the exigencies of a philosophy of science control all inquiry. And this is in turn to forget or disregard the fact that man in culture is considerably more than a scientific knower: he knows more than the scientist as such knows, and he engages in other activities besides those of knowing—he is morally, religiously and aesthetically active. Each one of the activities he engages in has its own kind of autonomy and is related in its own peculiar way to the others. Nor can any one of them, without a threat to the total organization of culture, assume the autocracy of a dominant interest. From the standpoint of these other activities, human life involves, as a matter of simple fact, complex and determinative structural relations of a purposive nature which are constitutive of human society, and it is drenched through and through with values which we no more create—although to some extent we can control—than we create—although in our puny way we control practically—the mountains and rivers of the world in which we live.

Our modern mind is instinct with hatred of value.¹⁰ This is

and then copied and perfected what nature presented in imperfect realizations; or has the aesthetic value of symmetry an independent source? I am inclined to think with Plato that the mathematical idea is the origin of both: the mathematical laws governing nature are the origin of symmetry in nature, the intuitive realization of the idea in the creative artist's mind its origin in art . . ." I am, however, going beyond Weyl and saying the creative mind discovers not only mathematical structure, but all kinds of structures and values.

¹⁰ The evidence for this assertion? It is to be gathered by anyone who chooses to look into the texture of our Western culture, as expressed in much of our poetry and painting, no less than in our philosophy, for our higher activities are instinct with self-hatred. It is to be found in

part of the suicidal compulsion of our culture. But since it is impossible to do away with value altogether, our modern mind does the next best thing, it tries to reduce value to desire or interest, and beyond this, to biological needs, and beyond these, to the processes of a physical nature which are a partial, if essential, component of human life. To suppose that a structure of meanings and values has status in being independently of the mind that apprehends them, the modern mind takes to be sheer superstition. But we must admit that the poem embodies an object. How then can we account for the seeming objectivity of aesthetic meaning and value? Rather than admit that it is grounded objectively in being itself, the contemporary philosopher invents *ad hoc* a process of "projection," or a totally mysterious process of "emergence," according to which the continuous chain of causation somehow ceases and does not cease at the same time to operate in nature, to lead to levels of existence that are and are not prefigured in the level out of which they emerge. By such means he makes his peace with the fact that in some sense culture is at its heart value phenomena, although he recognizes that, on his ontology, the universe must be maintained to be value-free.

There is, however, this difficulty to be explained: that the values a reader discovers in the poem are often utterly unrelated to the desires and emotions the poem arouses in him. The question, then, "How does the poem appear to embody values?" remains one of the puzzles of contemporary aesthetics. The solution of these puzzles and of a number of others is ready at hand; it is to grant that the poem reveals insistent meanings and values in and through its linguistic medium, which are not merely nominal projections of our desires but are revelations through symbolic representations of subsistent values and meanings, that therefore have status in being. When the meanings and values

Proust, in Joyce, in D. H. Lawrence, in Celine, in Paul Bowles, in Henry Miller, just as it can be found in the positivistic and analytic desire to debunk our belief in value and deny the objectivity of the structures which maintain culture. See Henry Miller, "The Universe of Death," in *The Cosmological Eye* (Norfolk, Conn., 1939), but note that the observations made by Miller about Proust and Joyce apply to Miller himself and to D. H. Lawrence, no less than they do to Proust, Joyce and many others of our contemporaries.

are embodied by the poet they become potentially constitutive of culture. And it is this relation of poetry to culture that gives it its exalted and unsubstitutable function. Insofar as poetry discloses by creating the operative values and meanings of culture, poetry is constitutive of culture. With morality, knowledge and religion, art is one of the four main activities which the animal employs to transpose himself from the animal level and into the human. Through art, man makes himself into a human being.

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LOGICAL CONSTANTS:

PART I

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ALTHOUGH the use of logical constants is well established, there are important questions about their interpretation for which no answers seem widely accepted. Some of these questions are: A. 1. How is "logical constant" to be defined? 2. What and how do the constants mean? B. 3. How are the subjects of statements determined? 4. Does the unity of a proposition or statement derive from its formal features? and 5. Are the logical forms of propositions or statements enumerable *a priori*?

Fully adequate answers to these questions are best provided in a comprehensive philosophy of logic. Within shorter compass, it is nevertheless possible to be guided by some conditions that are necessary to adequate answers. These will be results of the analysis of propositions and statements. They are necessary, since no answers to the questions about the constants will be acceptable if, for example, it follows from the answers that propositions or statements cannot be unities, or that propositions or statements cannot be true or false.

Because it provides some of these necessary conditions, a brief account of propositions and statements will be a useful introduction to a discussion of the constants.¹

I

Upon what grounds do we understand that a configuration of letters or sounds may be true or false? Typographical and vocal conventions, of course, provide a signal. But even if such conventions were more assuring than they are, the peculiar marks of a statement have ultimately to be found elsewhere. They have to

¹ In what follows I have been most influenced by some ideas expressed by Charles S. Peirce, Paul Weiss, and Ludwig Wittgenstein.

be found, I think, in the special interpretability to which things that may be true or false are subject.

If a configuration of letters or sounds is a statement, then it should *show* that it can be true or false, and show also what can make it true or false. If *it* does not show that it can be true or false, there will be no ground for distinguishing a statement from any other form of speech; and if *it* does not show what can make it true or false, determination of grounds for its truth or falsity will be external and arbitrary.²

In order that a configuration of letters or sounds be a statement, then, *it* will have to be interpreted 1. to show *that* it is referential, and 2. to show to *what*, as a whole, it refers. Thus nothing that cannot be so interpreted will be a statement. And in every statement, signs admitting of these interpretations will have to be found.

Are there signs that can be so interpreted? If so, what are they like?

1. Those sentential signs which show that the configurations in which they occur are statements have to fulfill two functions: 1a. *they* must be understood to represent that *they* are parts of more extended expressions; and 1b. *they* must be understood to represent that the expressions of which they are parts refer to or indicate something else. The *something else* is that which can make the complete reference true or false. Signs which function in the first of the two ways, then, cannot be understood to *refer to* or *indicate* something else; if they were, they could not be interpreted to represent themselves as parts of expressions. They must therefore be understood to be incompletely referential, to be emasculated expressions requiring referential constituents. General terms are signs of this sort. They evidence their special interpretability when written as schemata like " — chair," " — to the left of —," etc.³

2. Signs of the second sort should function to show or direct

² This second requirement is not any of the familiar verifiability criteria, e.g., that the meaning of a statement is its method of verification. The requirement concerns, solely, the special interpretability of logical subjects.

³ Cf. G. Frege's notion of a function's being *ungesättigt* in *Philo-*

attention to what the statements in which they occur are about, and what can make those statements true or false. They would fulfill their function ideally if they were dynamically or causally connected to their referents. But the connection, for linguistic referential signs, is conventionally established. When it is, pronouns, proper names, and demonstratives are signs which usually function in the second of the two ways. In that function they have their significance in directing an interpreter to make, or be prepared to make, an observation of or reference to a certain locale.

Because of their similarity to signs that Peirce has classified, these two sorts of signs may be designated by terms he proposed: signs of the first sort are *icons*; signs of the second sort are *indices*.⁴

Configurations of letters or sounds are statements, then, if they can be interpreted to have iconic and indexical constituents, and to have these synthesized to constitute a single unit which can be true or false. Propositions, however, are not statements. They are not composed of letters or sounds, but are instead both descriptive and prescriptive of the sentential uses of the differently signifying letters and sounds. Propositions are, therefore, *like* habits and laws or rules for the use of terms. They are not themselves true or false (though statements that *conform* to them will be), and they may come into and pass out of existence as uses for terms become more or less determinate.⁵

With the view that statements must contain unified iconic and indexical signs, a suggestion for the interpretation of the logical constants naturally arises. It is: that the varieties of the logical constants will be closely affiliated with the sentential uses of iconic and indexical signs. In particular, there will be three

sophical Writings of Gottlob Frege, tr. by Max Black and Peter Geach (New York, 1952), pp. 21 ff.

⁴ Peirce's analysis of icons and indices is given in Volume II, Book II, *Collected Papers of Charles Sanders Peirce*, ed. by Charles Hartshorne and Paul Weiss (Cambridge, 1932).

⁵ The idea that propositions are neither true nor false has been detailed by P. F. Strawson, in connection with sentences and the uses of sentences, in "On Referring," *Mind*, LX (July, 1950), and *Introduction to Logical Theory* (London, 1952).

kinds of constants. There will be a constant which shows that elements have properties; it will refer to the unity, the synthesis, of icons and indices. There will be constants which make it possible to form compounds; these will be affiliated with the use of icons. And there will be constants which fix the scope of variables; these will be affiliated with the use of indices.*

These suggested interpretations are developed, in order, in the following sections.

II

Statements must contain iconic and indexical constituents and must be unities of them. The problem, then, is not to understand how a statement differs from a collection of referring names, but how its iconic and indexical constituents may be synthesized.⁷

Philosophical accounts of propositional unity have, in general, consisted of one or the other of two solutions: that the unity of propositions or statements is the result of the operation of some *third* or *extra* thing, or is due to an internal relation between constituent signs.⁸ But there are difficulties for both of these solutions. They arise, on the one hand, over the character of the third or extra thing, the manner of its bond with the constituents synthesized, and the nature of the constituents themselves.⁹ On the other hand, difficulties arise over the nature of the internal

* These three kinds of constants will be the *epsilon* connective, the statement connectives, and the quantifiers. Statement connectives are here considered to connect icons in statements.

⁷ The view that statements are indexical partly opposes a pure correspondence theory of truth. One merit of this view is that it accommodates the observation that there are not independent analyses of *the form of a statement* and *the form of its corresponding fact*. Rather, attention being directed to a fact, statements are, if possible, analyzed so as to correspond to the fact. An initial reference to fact, however, cannot be provided unless statements are construed to be indexical.

⁸ Ralph Eaton's *Symbolism and Truth* (Cambridge, 1925) and J. A. Chadwick's "Logical Constants," *Mind*, XXXVI, provide solutions of the first sort; so do most Kantians. L. Wittgenstein's *Tractatus Logico-Philosophicus* (London, 1933) provides a solution of the second sort.

⁹ See Frank Ramsey, *The Foundations of Mathematics* (London, 1931), p. 146; Paul Weiss, *Reality* (Princeton, 1938), pp. 74 ff.

properties of unmediated synthesized constituents, the nature of these constituents themselves, and the external relations of propositions.¹⁰

To avoid the special difficulties of both these solutions, a median course between them will have to allow for the intelligibility of the separate connective between sentential constituents, if there is one. And if there is no separate connective, it will have to allow for the separability of internally related sentential constituents. Such a course, it seems, is provided in considering what iconic and simple indexical signs represent.

Icons and indices represent abstracted aspects of facts: the facts that are referred to by the statements in which the icons and indices occur. Indices lead us to attend to facts, as prescinded from their qualitative features. They lead us to treat facts as things opposed to us, as unqualified *its*. Icons, on the other hand, represent those features of facts which we contemplate when we prescind from the opposition of facts and treat states of affairs without regard to anything other than themselves. Unities of icons and indices, then, lead us to attend to oppositional, qualitatively characterized individuals. And they do and can do this in virtue of the insufficiency of icons and indices separately to sustain non-vague or determinate representations. In treating a term as an index, the boundaries of its referent are left vague, although the focus of the reference is itself fixed. The vagueness of the boundaries is eliminated by the objects of icons. Thus, the vagueness attaching to the correlate of the "this" of (an ordinary use of) "this is white" is removed (partially) by the correlate of the icon " — is white." An icon, of course, has its own indeterminacy; for an icon *pictures* a possibility, but it does not specify where that picture is relevant. It leaves that open to an index.¹¹

Icons and indices, then, are synthesized by interpreters. They are synthesized when interpreters understand 1. an icon to

¹⁰ See Max Black, "Wittgenstein's Tractatus" in *Language and Philosophy* (Ithaca, 1949); Irwin C. Lieb, *Logical Form* (Yale University Library).

¹¹ Cf. Paul Weiss, *op. cit.*

represent a possibility that fixes the extent of the referent of an index, and 2. an index to provide a referent that specifies a locus for an otherwise indeterminately relevant possibility. The icons and indices of a statement can be understood to be so synthesized, though, only if they are understood to represent suitably abstracted aspects of facts, those aspects of uniqueness and generality that coalesce in presented states of affairs.

The character of icons and indices and their objects thus assures that no *separate* third thing is required to provide a sentential unity; but rather that icons and indices are synthesized when interpreters recognize them to be abstracted aspects of states of affairs. Depending upon the symbolism for such abstracted aspects, some sign of their connection may find a use. In natural languages one such sign is the *is* of assertion or belief; in symbolic systems, one such sign is the *epsilon* constant.¹² The correlate in each occurrence of such signs is a *fact*, specified discursively through iconic and indexical constituents; the correlate for such signs generally is factuality. If there were no correlate for such signs, or if the correlate were not a fact, statements would not be referential, and there would be no locus for iconic and indexical aspects. *Subjects* and *predicates* would then exhaust the states of affairs which they *reproduce*. But because statements are as a whole referential, and because there is no question that something further could always be said about the referent of a statement, it seems necessary to understand a constant for assertion or belief (in its sentential use) to indicate a fact which icons and indices together articulate. Thus the third thing that grounds an interpreter's sentential synthesis is not a relation of mysterious function and character. It is instead that fact from which the signified aspects are abstracted and by which they are conditioned.¹³

¹² In a functional notation, where no *epsilon* is used, the spatial contiguity of the function and argument signs may be taken as a *sign* of their connection.

¹³ The requirement that statements must be constituted of synthesized iconic and indexical signs furnishes the most general form of statements. Cf. e.g., Wittgenstein's view: "It is clear that in the description of the most general form of proposition *only* what is essential to it may be described—otherwise it would not be the most general form The

III

The constants which are of special interest to the most elementary part of logic are the constants which connect statements to form compounds. These are the constants which connect icons to form relatively more complicated icons.

About the meaning and the reference of the connective constants, there have been mainly two views: that the constants do not refer, and that they do. On the first view, compounded statements are regarded as properly reducible to complexes of simpler statements, and perhaps ultimately reducible to concatenations of logically proper names; the sign of complexity, on this view, is sometimes regarded as a *punctuation mark* that has no referent but which may derive its constant meaning through *expressing* a mental state.¹⁴ On the view that the constants refer, their referents are sometimes said to be relations which differ from non-logical relations only in generality and in the peculiarity of their function.¹⁵

But difficulties attach to both of these views and their details. In the first case, they arise in accounting for the commensurability of operators and operands, the unity of compounded statements, and the discreteness of logic and psychology.¹⁶ For the view that the connective constants are denotative, there are difficulties in accounting for the peculiarities of logical relations denoted and the presumed necessity of valid deductive arguments.¹⁷

Whatever view of the connective constants is correct, however, cannot be settled independently of the nature of icons. For the operations to be accounted are supposed to connect icons in

general form of proposition is: Such and such is the case." Op. cit., proposition 4.5. Also see Paul Weiss, op. cit., pp. 144 ff.

¹⁴ See F. Ramsey, op. cit.; B. Russell, *Inquiry into Meaning and Truth* (London, 1940), pp. 85 ff; *The Philosophy of Bertrand Russell*, ed. by P. A. Schlipp (Menosha, 1946), p. 688; L. Wittgenstein, op. cit.

¹⁵ See J. Chadwick, op. cit.; R. Eaton, op. cit.

¹⁶ See F. H. Bradley, *Principles of Logic* (London, 1950); J. A. Chadwick, op. cit.; J. Dewey, *Logic: The Theory of Inquiry* (New York, 1938); C. Langford "On Propositions Belonging to Logic," *Mind*, XXXVI; I. Lieb, op. cit.

¹⁷ See F. Ramsey, op. cit.

the statements in which they occur. And if icons provided no conditions upon their possible compounds, disjunctions and conjunctions of icons would be as inadmissible as icons which are compounded only by wishes; for in both cases, the acts of compounding would be indifferent to the icons.

Since icons function to make indices determinate, the idea suggests itself that there may be *modes of determination*, that these modes of determination may be represented by connective constants, and that a specification of these modes will provide an acceptable account of the variety and function of the logical constants.

If there are such modes of determination, they will derive from the function of certain sorts of qualities: qualities that can be represented by icons and that can make the objects of indices determinate in specifiable ways. I think Kant can help us to settle what some of these modes of determination are.

In his "Appendix to the Transcendental Dialectic," Kant argues that reason imposes three regulative principles: the principles of homogeneity, specification, and affinity.¹⁸ As laws about whatever qualities there may be, the principle of homogeneity provides that for any quality there is some quality of which it is a further determination; the principle of specification provides that for every quality, there is another which is a further determination of it; and finally, the principle of affinity provides that for any two qualities of which one is a further determination of the other, there is a third which is a further determination of the first and of which the second is itself a determination.

Kant treats these principles as maxims for the study of *phenomena*. However, if one refinement is attached to the earlier account of icons, something much stronger can be said: that these are not maxims but necessary truths.

The requisite refinement is that icons represent not simply the aspect of perceptibles that remains when oppositional features are abstracted, but that they represent only features that are at

¹⁸ I. Kant, *Critique of Pure Reason*, A 642 b, B 670 b, ff. See E. Caird, *The Critical Philosophy of Immanuel Kant* (New York, 1889), II, 121 ff., and E. Cassirer, *The Problem of Knowledge* (New Haven, 1950), pp. 124 ff.

least doubly abstracted; the features that can be abstracted from and thus specified in a field that is isolated when objects of attention are considered in disregard of their oppositional individuality. The justification for this refinement derives from two related requirements: 1. that icons make indices determinate;¹⁹ and 2. that icons and indices be unified to form statements. Both of these requirements would be violated if icons did not represent at least doubly abstracted aspects of states of affairs. 1. If that from which all icons could be abstracted were itself representable by an icon, the icon would be an *ultimate icon*. Purporting to represent the undifferentiated totality of possible determinations, it would exclude nothing. As a consequence, it would be completely unspecified; and it could therefore not function to represent an aspect that makes the referent of an index determinate. 2. In not being able to fix the extent of the referent of an index, an *icon* purporting to represent the totality of determinations would not be subject to the interpretability that is requisite for the unity of a statement. Thus, if they are to have the uses ascribed to them, all icons must represent aspects that are at least doubly abstracted.²⁰ If they do, Kant's principles of homogeneity, specification, and affinity state necessary truths.

The principle of homogeneity provides that for any quality there is another of which the first is a further specification. This could be false only if there is a quality such that no quality could be of greater generality. Yet the only *quality* that could satisfy this condition would be the one of which *all* qualities are further specifications. But that ultimate, incapable of functioning as a quality, could not be represented by an icon. It cannot, therefore, be a quality. So that the condition for the falsity of the principle is impossible, and the principle itself is necessarily true.

The principle of specification provides that for any quality there is another which is a further specification of it. Because there can be no icon that cannot function to make an index

¹⁹ The corresponding requirement for qualities is that qualities make *individuals* determinate.

²⁰ This conclusion, if correct, can help meet some of the standard logical paradoxes.

determinate, every icon must be such that it could fulfill its function upon the maturity of some condition. That condition, however, cannot be provided by an index; for a pure index presents its object to be qualitatively indeterminate. The condition must then be provided by an icon. There are thus three possibilities: for any icon, the condition for its necessary application may be provided by 1. an icon of which the first is a determination, 2. an icon that is *independent* of the first one, or 3. an icon which is a further determination of the initial one. But the first two of these exhaustive possibilities are inadmissible. For though the applicability of a generic quality may require that some further specification of it is applicable, it does not settle which one is necessarily applicable; and independence of two icons consists precisely in one not being necessary to the applicability or inapplicability of the other, and vice versa. Only one possibility remains. Since every icon must function upon the maturity of some condition, and since the condition of the required sort is the applicability of a *specification* of that icon, for every quality there must be another which is a further specification of it; and for every icon, depending upon the richness of a symbolism, there may be an icon which represents a determination of the quality represented by the initial one.

The principle of affinity, finally, provides that for any two qualities, of which one is a further specification of the other, there is some third which is a further determination of the first and of which the second itself is a determination. That there must be such a quality, and that there may be an icon representing it, arises with the view that icons rightly represent qualities to be at least doubly abstracted aspects of facts. If there could be no quality intermediate in determinateness between two properties (say, A and B) which stand to each other as determination to determinable, its absence must be due either to there not being an aspect from which it might have been abstracted, or from A's being the *least* possible further determination of B. Both of these supposed exceptions do not, however, mature. For, in the case of the first, any further determination of B could be abstracted from the states of affairs from which B itself is abstracted; and so long as there is a possibility of a quality, there must be that

quality. It is the possibility of the intermediate quality which is challenged by the second supposition: that for a given quality there may be a least possible further specification of it. But this supposition, too, is unfounded; for no determinations of a quality can exhaust that quality, and, consequently, no one of them is *nearest* to exhausting it. Accordingly, because there is a genuine possibility for there being a quality intermediate in determinateness between any two suitable others, there *must*, in those cases, be that quality. Kant's principle of affinity, then, like the principle of homogeneity and specification, finds its foundation as an objective law about the sorts of qualities there must be.

With the evidences that Kant's principles furnish (at least some) genuine requirements about the disposition of the population of qualities, it is possible to proceed further: to show that the principles provide for modes in which icons make indices determinate, and that such modes may be represented by several connective constants.

The exhibition of these conclusions depends upon the fact that Kant's principles tell us what sorts of qualities there must be, if there are any qualities at all. The importance of such special prescribed qualities derives, in turn, from their possible function in facts, and from the function of *their* icons in sentences. These functions are, again, to make indices and their referents determinate. Thus the variety of icon that one joins to a given index *shows* the judged determinateness of the referent of indication. *But since qualities have their reality as abstracted aspects of something else, whatever laws there may be about the existence of qualities are derivatively laws about the possible determination of indices by icons.*²¹ In the special cases of the principles of homogeneity, specification, and affinity, provision is made for the possibility of icons which may be used in statements in special and explicit ways. They may be used, for example, to show that the referents of their indices are made determinate in a single line of characters beginning with a specified lowest, by some further determination of a given quality, or by a quality intermediate be-

²¹ They are also laws about the possible determination of individuals by qualities.

tween two others. The principles of homogeneity, specification, and affinity, that is, provide for the possibility of icons which represent such abstracted aspects as those principles require; aspects which can also be represented to show that they are such qualities as the principles require.

To represent that icons purport to represent such qualities as Kant's principles require, three special connective constants are needed. The function of these constants, then, will be to show that the icons with which they are connected combine to represent such abstracted aspects as Kant's principles require, and to represent them *as* qualities prescribed by such principles. Fulfilling this function, the three constants will serve derivatively to represent the special and explicit ways in which the icons of which they are parts make their indices determinate. So far as they represent these ways, the constants will not *mean* in the same way indices do; for unlike indices, they are not directly or indirectly connected with particular states of affairs. Nor will the constants *mean* in the same way that icons do; for unlike icons, they do not represent abstracted aspects of states of affairs. The special connective constants, then, are not logically proper names, nor are they the names for qualities or relations. Rather, they are symbols, which, in their particular occurrences, are understood to show that those occurrences purport to be instances of Kant's principles about qualities. Special feelings may very well attach to their use, as they may attend the use of any expressions. Yet the special constants are not surrogates for mental states; for their objects, Kant's principles of qualities, are as objectively founded as are the objects of icons and indices.²²

The three special connective constants that are *provided* by the principles of quality are constants for *conditional*, *disparate*, and *intimate* determinateness. They are provided, respectively, by the principles of homogeneity, specification, and affinity; and

²² If this account of the constants is correct, and if it can be extended to the truth functional constants, Russell and Wittgenstein, for example, will be right in arguing that the connective constants are not names of objects, but wrong in construing them as unconnected with the world; Chadwick and Eaton, for example, will be right in arguing that the constants are objective, but wrong in construing them as relations.

their function is, again, two-fold: 1. they represent that the icons with which they are combined purport to represent such qualities as Kant's principles require, and represent them to be *as* the principles prescribe; and 2. they show, derivatively, the ways in which the combined icons of which they are parts make their attached indices determinate.

In the first case, the principle of homogeneity provides for the *entailment* connective. When used correctly between icons, the connective shows 1. that another quality is required by the object of the antecedent icon, and is represented to be so required; and 2. that the composite icon makes its index determinate by representing its referent to be determined along a single line of characters by a specified original of quality and a more general terminal.

In the second case, the principle of specification provides for a special *disparity* connective: one which combines with icons to represent that the referent of the attached index, made determinate by some quality, is subject to further determination in the same line of characters by some one or another of the multiple specifications required of the initial quality. The disparity connective, then, represents 1. that the icons of which it is part purport to represent that a quality is subject to further disparate determinations; and 2. that the composite icon makes its index determinate by representing its referent to be made determinate along a single line of characters by a specified original quality and an unspecified but more determinate terminal one.

In the third case, the principle of affinity provides for a special *intimacy* connective; one which combines with icons to represent that the referent of an attached index is made determinate by a quality intermediate in specificity between two suitable others. The connective thus represents 1. that the icons with which it is combined purport to represent a quality intermediate in determinateness between a given quality and a further determination of it; and 2. that the composite icon makes its index determinate by representing its object to be made determinate by a quality which is located in a continuum of characters between a specified origin and terminal.

These three special connectives, then, in affiliation with icons,

indirectly represent the principles of quality. They are properly constants, for they represent the invariable ways in which the icons of which they are parts make their indices determinate. They are properly formal or logical, for they do this without regard to the peculiar nature of the (objects of the) related qualities they connect.

Yet these are not all the constants there are. For 1. *wherever* these special connectives find a use, customary truth functional connectives must also find a use; and 2. *whenever* the special connectives find a use, it must be the case that truth functional connectives could find a use elsewhere.

1. It is plain, for example, that if the referent of an index that is made determinate by one quality must also be made determinate by a quality of which the first is a specification, then it is necessary that that referent, *if* made determinate by the one quality, will *then* as a matter of fact be made determinate by the other.²³ Likewise, it is plain that where the referent of an index is made determinate by a quality that necessarily admits of further specification, it must be the case that that referent is as a matter of fact made determinate by one *or* another of the specifications of the quality.²⁴ And finally, it is plain that if the referent of an index is made determinate by a quality that is intermediate in specificity between two others, it must be the case that it is as a matter of fact made determinate by that quality *and* that one of the other two of which it is a specification.

2. What is not obvious, however, is that if the referent of an index is made determinate by some composite icon that incorporates a special connective, it must also be possible for it to be made determinate by some truth functional composite of logically independent icons.²⁵ Yet this too is true. And it is so for the reason that its falsity is impossible. It would not be possible for there to be truth functional combinations of icons that represent logically independent qualities if there were no logically independent qualities. The requisite sort of dependence, however,

²³ $(x... \varepsilon ((\varphi \text{ entails } \psi) \text{ entails } (\varphi \supset \psi)))$.

²⁴ $(x... \varepsilon ((\varphi \text{ disparate } \psi) \text{ entails } (\varphi \vee \psi... \cdot ((\varphi \cdot \psi...) \text{ entails } (\varphi \text{ disparate } \psi))))$.

²⁵ $(x... \varepsilon ((\varphi \text{ intimate } \psi) \text{ entails } (\varphi \cdot \psi \cdot (\psi \text{ entails } \psi))))$.

²⁶ e. g., $(\exists q)(x... \varepsilon ((\varphi \text{ entails } \psi) \text{ entails } (\varphi \supset q \cdot \sim (\varphi \text{ entails } q) \cdot \sim (\psi \text{ entails } \varphi))))$.

would demand that all qualities shall be identical with or be specifications of a single, ultimate, generic *quality*. But such a quality, for the reasons which sponsor the principle of homogeneity, and because of the considerations about the function of icons and the grounds for intelligibility which ground those reasons, is impossible. Its impossibility, then, necessarily assures the existence of logically independent qualities, and the possibility of truth functional compounds of logically independent icons.

Such compounds are not without restrictions. For the application of the truth functional connectives depends upon settling what are the agreements and disagreements with the possibilities for truthful representation by icons.²⁷ The specification of these possibilities, if it is not to be something arbitrary, cannot be made without recourse to an investigation of the sorts of qualities whose signs can possibly be combined in statements. Thus a formation rule stipulating that, for *any* two icons, a truth functional compound of them is possible is far too strong. The weakest admissible permission would be that, for every icon, there is at least one other that is independent of it and which can be combined with it by a truth functional connective. Other stronger permissions, however, cannot similarly be settled by a consideration of icons as such. Instead, they must derive from investigations which assure that for qualities of so-and-so sorts, there are qualities of such-and-such sorts which conjointly, disjunctively, and by implication could make the indices to which they are attracted determinate. These investigations, then, while not simply or entirely *a posteriori*, nevertheless must initially pro-

²⁷ See L. Wittgenstein, "Some Remarks on Logical Form," in *Aristotelian Society Supplementary Volume IX*. F. Ramsey rejects the view that agreements and disagreements in the truth possibilities of statements are not specifiable *a priori*: op. cit., p. 152. He says that "... formal logic is not concerned with it, but presupposes that all the truth possibilities of atomic sentences are really possible, or at least treats them as being so." This rejection would be better founded if logically independent atomic sentences were dealt with in logic, or if they were the only sorts of sentences dealt with in logic. Because they are not, and because the whole question concerns the determination of possibilities, Ramsey's rejection is evasive. Without a firm account of possibility and impossibility, for the purposes of logic, it is self-defeating.

ceed from confronted things. They consist in explorations of the possibilities relevant to *those things*. No such requirement is essential, however, to the inquiries which ground Kant's principles. This difference in requirements signalizes the difference in the results of the two investigations: Kant's principles provide for dispositions of the qualities there must be, if there are qualities at all; a *principle for the qualities of things* provides for the qualities special things (and sorts of things) may have, and for the sorts of qualities special things (and sorts of things) must have.²⁸ There is then, correspondingly, a difference in the interpretation of the use of the special and the truth functional constants: on the one hand, the special constants represent that the icons with which they are combined in statements purport to represent instances of qualities disposed according to necessary principles in a single line of characters. Derivatively they show that the icons in which they are incorporated purport to make their indices determinate in special ways. On the other hand, the truth functional constants represent that the icons with which they are combined purport to represent specifications of the qualities which their correlative index must have, which specified qualities mutually and in supplemental ways make their index determinate in multiple character lines. For example, a truth functionally compounded icon may make its attached index determinate by representing its referent to be made determinate by two qualities in independent character lines, by one or another quality in the same or different lines, and by a character of one line if by a character of another. Despite their variety, these modes of truth functional determination are general, and are themselves specifications of a single mode of determination: one that can be introduced through well known devices once the notions of "and" and "not" are provided.²⁹ These, however, are seen to be already implicit in the principle that indices must admit of determination in multiple character lines—must admit of determination, that is, in one *and another* line. So far, then, as that principle will employ the notions

²⁸ This requires that *accidental* qualities be relevant to the things of which they are accidents, and that not all the qualities that are inessential to a thing need be accidents of it.

²⁹ E.g. by the functions of *incompatibility* or *joint denial*.

requisite for the modes of truth functional determination, both the special and truth functional constants will find their interpretation through three necessary principles. For statements, 1. indices must be made determinate by icons, 2. they must admit of continuous determination in any single line of applicable qualities, and 3. they must admit of determination in multiple lines of qualities. The import of the last of these principles, however, has not been sufficiently drawn. A full interpretation of the varieties of the connective constants must await a statement on negation: one to be extended from commitments involved in the general principles given above.

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PREFACE TO COSMOGRAPHY

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So soon as it is apparent that metaphysicians differ in their views of reality, the idea of cosmography appears as an ideal. It seems desirable and challenging to build some single "map" of the cosmos and its full content, which will include all the results and insights of the philosophical explorations that have taken different thinkers in different directions.

But cosmography remains an ideal only, because of technical difficulties in finding a proper "projection" of the different charts onto a single master-map. The past fate of cosmographic enterprise has been to wind up in irritation at the fact that others' charts fail to match our own in regions we ourselves have explored; and this naturally leads to accusations of faulty observation by the other explorers.

In my present discussion, I want to suggest that this conclusion is not necessary, but results from too simple a notion of how different systems of mapping are related and may be superimposed. I want also to indicate a type of projection which seems to make possible a real development of cosmography.

In handling another metaphysical system's relation to his own, a thinker must do two things. First, he must transform the ideas he finds into statements commensurate with those in his own system; then he must appraise the result by comparing his own statements to those of this transformed alternative. (I am using "transformation" here as the rule for what was metaphorically called "projection.")

In the study of transformations of systems, there are alternative possible rules. In four classes of transformations between differing families of metaphysical systems, I will show that a first rule, which assumes the basic coordinates to be the same (that is, which assumes basic identity between systems in the meaning attached to "reality," "possibility," and "actuality") will result in a transformed version exactly contradictory to the system by which it is being appraised. A second rule, involving the assumption

that differences between system families reflect basic shifts in orientation, can be given, which results in a transformed version that is almost the same as the system by which it is appraised.¹ There is no way of getting a consistent single map from pairs of these systems if the first of these transformation formulae is used to relate them, but there is no problem at all when their relation is stated by the second formula (or at least cartographically there is only a minor problem of how coordinates are to be labelled). Historically, however, metaphysicians have usually seemed unwilling to admit that there can be as great a difference between systems as the second rule implies: it has seemed more credible to them that other philosophers have observed badly than that they have had compasses and coordinates that functioned differently. Historically, there has been no large scale success in cosmographic construction.

To show one class of relations of systems where the rules and results described above apply, let me take the case of Aristotle's philosophy in its relation to another class of metaphysical systems.² The other class I want to consider has as a common basic feature a stress on the togetherness and dynamic, emergent character of the actual world, an actual world identified with the "concrete." In this family of philosophies I would want to include such Greek thinkers as Heraclitus, Anaxagoras, Speusippus, and such contemporary and recent philosophers as Bergson, Whitehead, Alexander, Dewey, Morgan, and Weiss. It is evident that this way of thinking is peculiarly important in our twentieth century speculative tradition, a fact that will presently be shown to illuminate the contemporary role of Aristotle's philosophy.

Although information as to the full detail of the classical

¹ Rather precise results follow from a treatment of transformation in terms of four factors, but the present discussion uses only two. The others would be needed to account for the differences between a "physical" atomism (as in Democritus) and a "psychological" one (as in Hume), and for the differences between ranges of "complementary" terms, which usually will not coincide exactly with the present simple relation.

² Aristotle is chosen as representative of a class of systems, in which I would also include those of Aquinas and Kant, and in the twentieth century that of McKeon. An identifying property of this family is the repeated resolution of problems by introducing sharp distinctions.

systems of this family is lacking (partly because Aristotle was less full in reporting these views than others), their resemblance and comparability is shown by the fact that one can cite very specific passages in Whitehead's *Science and the Modern World* which have the same relation to Aristotle's position, and express the same views, as the fragments of three early thinkers I group together, to wit, Anaxagoras, Speusippus, and Heraclitus.³

As a basis for discussing transformation, I propose to examine the treatment of several key concepts both in these systems and those of the Aristotelian kind.

1. *Actuality*. For Aristotle, what is most actual is substance, and substances are separate both in thought and in fact.⁴ For Anaxagoras, it is absurd to think that entities in a common actual world could be "cut off from one another with a hatchet."⁵

2. *Possibility*. For Aristotle, such possibilities as those of alternative future events are co-present, and if an A proposition in this mode is true, it implies the truth of the contrary E.⁶ The counterpart to this view in the other set of systems is most clearly stated in Whitehead's principle of "the isolation of eternal objects," where there is sharp separation between entities within the "realm of possibility."⁷ The classical counterpart seems to me to appear in Speusippus' assertion (?) that "the one," the basic principle of his system of mathematical structures, "does not exist."⁸

³ As Aristotle writes his history in *Metaphysics* A, these classical thinkers could have been included as a group who put their main stress on *efficient* rather than *material* causes. But Aristotle saw no such category of possible metaphysical systems, as distinct from the "materialism" and "idealism" he sought to mediate between.

⁴ *Categories* 2a10 ff.

⁵ Fragment 8 (Diels). See J. Burnet, *Early Greek Philosophy*, (4th edn.), p. 259. Compare Whitehead, *Science and the Modern World* (which will be cited to show that these concepts occur together in a single argument as well as in a single system), (New York, reprint 1946), pp. 93-108.

⁶ *De Interpretatione* 21b11-15; 18a28-19b5.

⁷ Whitehead, *op. cit.*, 237.

⁸ This appears in Aristotle, *Metaphysics* 1092a11-17; whether it is a paraphrase or Aristotle's own suggestion of a needed consistent extension, the doctrine seems consistent with Speusippus' position.

3. *Location.* For Aristotle, relations of place derive from relations of substance, and substances have proper places, where they are simply located.⁹ For Anaxagoras, entities are together in a matrix of space where they overlap and are diffusely located; this also holds, as far as one can tell, for Heraclitus.¹⁰

4. *Time.* For Aristotle, time is basically cyclic, and the cycles of the heavens provide a basic regulative force and measure for the development of organisms and other phenomena.¹¹ For Anaxagoras, there seems to be a process of cosmic evolution, in which time as a principle of emergence and internal development does not have Aristotelian closure.¹²

5. *Infinity.* For Aristotle, neither the infinite nor the infinitesimal exists actually; for Anaxagoras, both are present in actuality; there are transfinite worlds, and transfinite infinitesimals in any continuum.¹³

6. *Mathematics.* For Aristotle, mathematics proceeds by abstraction from actuality.¹⁴ Both Aristotle and Whitehead would agree in saying that, for Anaxagoras, mathematics proceeds by abstraction from possibility.¹⁵

7. *Relation.* For Aristotle, relations are external, and so insubstantial that one cannot abstract them from relata; for Speusippus, as later for Whitehead, relations are constitutive of actuality, and an actual entity is seen as determined by a relational net.¹⁶

⁹ *Physics* 209a ff.; *De Caelo* 276a-277b; compare *Categories* 11b10.

¹⁰ Anaxagoras, Fragment 6 (Diels); Heraclitus, Fragment 59. Compare Whitehead, op. cit., 101-106.

¹¹ *De Gen. et Corr.* 336b5-25.

¹² Burnet, op. cit., 269-75, discusses the stages of such an evolution; my notion of the status of internal time may, however, not follow. Certainly it is clear in Whitehead, op. cit., 176, and in the metaphor of "tilted" time systems running through his *Principle of Relativity* and *Principles of Natural Knowledge*.

¹³ Aristotle, *Physics* 203b15 ff.; Anaxagoras, Frags. 5,6.

¹⁴ *Metaphysics* M chaps. 3, 10.

¹⁵ So Aristotle in *Metaphysics* Lambda relegates "the one of Anaxagoras" to potentiality; see Whitehead, op. cit., 245-46 (where a distinction is supplied for what is not so clear in chap. ii).

¹⁶ Aristotle, *Categories* 6a35 ff. Speusippus' project of a complete

8. *Explanation.* For Aristotle, this is demonstration in which a middle term shows causal connection between two extremes. The terms are used univocally, and all three must be homogeneous.¹⁷ For Heraclitus explanation involves focusing in a single locus both the concrete poetic impact of an aphorism (where terms are used metaphorically) and the "common" *logos* which is present in the concrete. The terms of such explanation are neither literal nor homogeneous, and the form seems (in the dimension of concrete presentation) to justify denial of the law of contradiction. Anaxagoras and Speusippus are equally addicted to metaphor and to violating the requirement of Aristotle for homogeneous terms in demonstration, but do not seem to have used poetry in the same way for direct presentation.¹⁸ (Bergson's method of beginning with an abstract analysis, ending with a sensitive concrete metaphor, is a good modern counterpart of this mode of demonstration.)¹⁹

First Transformation. Looking at these relations, and at the actual passages in which Aristotle criticizes Anaxagoras, Heraclitus, and Speusippus, and those in which our modern writers of this group (with the exception of Weiss) criticize Aristotle, we see that a kind of ontological statement of De Morgan's Law provides one formula of transformation between these systems. Taking "v" and "." as connectives showing a togetherness or separateness of entities, this can be stated.

(1) $p \vee \sim q$ [Aristotle] = $\sim (\sim p \cdot q)$ [Anaxagoras et al], and conversely.

For example, "Either an entity is separable or it is not actual" is an Aristotelian proposition, true in his system; but "Nothing

chart of relations is reported by Aristotle, *Anal. Post.* 97a6 ff.; compare this with Whitehead, op. cit., 229-31.

¹⁷ *Anal. Post.* 71b10 ff.

¹⁸ See the translations of the fragments in Burnet, op. cit. Compare Whitehead, op. cit., 284. Aristotle reports the denial of the law of contradiction in *Metaphysics* Gamma. My point is clearer from actual explanatory technique than from any precepts given.

¹⁹ For a paradigm of such explanation by transition from analysis to concrete metaphor, Bergson's *Introduction to Metaphysics* serves well, particularly in its discussion of "motion."

is an inseparable entity and actual" is the contradictory of a basic proposition for Anaxagoras and Whitehead. The converse transformation of Anaxagoras makes him assert that "Either an entity is actual or it is separable," which contradicts Aristotle's position.

This formula expresses the result of assuming that both systems are using the same basic coordinates of reference, but are asserting different formal relations between the same entities. The transformed version can easily be compared, and is false in the system used for appraisal, or in certain cases (where denial of an axiom is considered self-contradictory) is "meaningless" or "aphilosophical" in its relation to the context of the appraising system.

This is the interpretation which underlies Aristotle's treatment of the supposed rejection of the law of contradiction by Heraclitus, and of the law of excluded middle by Anaxagoras.²⁰ It also, to take a more recent example, underlies Whitehead's treatment of Aristotelian logic, scientific method, cosmology, and theology.²¹ Insofar as Whitehead typifies twentieth-century orientation, this reaction is typical of that of many modern readers who are puzzled and not impressed by Aristotle.

Evidently, this transformation, if it is the only one available, makes cosmography impossible: one map shows us islands where the other has connected continents, and there is no way to combine them.

Second transformation. If, instead of negating and exchanging connectives, we simply reverse modality, so that statements about "actuality" in one set of systems are transformed into statements about "possibility" in the other, (carrying this through so that statements of "fact" become "fictions," statements about "reality" transform to statements about "appearance"), the resulting propositions are true in the appraising system. We can state this rule simply:

²⁰ *Metaphysics* 1005b5 ff.; 1007b17 ff.

²¹ All of which are rejected in the course of *Science and the Modern World*.

(2) [Aristotle et al] In the realm of actuality . . . = [Anaxagoras et al] In the realm of possibility . . . ; and conversely.

This can be verified by comparing the treatment of the key concepts summarized above. (Its applicability is perhaps peculiarly clear in Whitehead, because of his explicit discussion of the "realm of possibility.") For example, the infinite by addition and by division are for Aristotle only potential, the result of possible construction; for Anaxagoras, as we have seen, both transfinite sets and infinitesimals are actual, and their existence is clear from observation. (As another example, compare Whitehead's "isolation of eternal objects," which are the entities making up "the realm of possibility," with Aristotle's "separateness of first substances," the entities making up his realm of actuality.)

To the twentieth-century reader, this second rule suggests a way of interpreting Aristotle which makes him seem a cogent and important thinker, anticipating many of our recent ideas (see, for example, Weiss, *Reality*, p. 208, n. 2). But if one tries to read him in this way, the actual result is mixed: we find many interesting insights anticipated, yet Aristotle's works as wholes seem anti-climactic; the problems are not given what we hoped for as resolution. This reaction must be familiar to anyone who has tried teaching Aristotle sympathetically to contemporary students (whose expectations derive from a basically "Whiteheadian" orientation). This does not either invalidate the rule of transformation or show a defect in Aristotle's philosophy. Since the order of Aristotle's works is from *potential* to *actual* knowledge, if we reverse the modality of statements, we must reverse the order, too. What I am saying here is that Aristotle becomes an interesting and intelligible philosopher in our contemporary mode (insofar as that mode is oriented toward a "dynamic, emergent" cosmos) if we transpose modality, and read each of his works from end to beginning, instead of from beginning to end. The *Metaphysics*, for example, read in this way, opens with an abstract criticism of the "misplaced concreteness" of the Platonists (in Bks. N and M) and culminates in Aristotle's presentation of the four-dimensional character of concrete existence, a discovery resolving the abstract antinomy of Platonism and atomism (this is in Bk. A). Or the *Poetics* becomes a work proceeding from the misplaced abstract

expectations of critics through considerations of poetic technique, then of aesthetic form, to a clarified insight into the ontological status of fine art (which "imitates" nature, yet is "more philosophical than history"). The *De Partibus Animalium* becomes a cogent defense of scientific recognition of teleology. And others similarly.

This "interpretation" is something like a physical tensor that turns a "left-handed" into a "right-handed" system. Clearly, its result is not identical with the philosophy that Aristotle developed, but equally clearly that philosophy results from observation in the same cosmos as our contemporary one, even if its compass-points are the reverse of our own.

The relations between other families of philosophies can be expressed by similar pairs of transformations, one leading to apparent contradiction, one to evident agreement within different basic frames of reference. However, the formulae (1) and (2) above work only for the interpretations between "dynamic" and "Aristotelian" systems, and between the families of "Platonism" and "atomism."²² Taking the concepts used before for purposes of illustration, we may compare Plato and Epicurus as representatives of these two families.

1. *Actuality*. For Epicurus, actuality lies in the concrete atom, for Plato, actuality lies in the intelligible form.²³

2. *Possibility*. For Democritus, (presumably he follows Leucippus on this point) though not for Epicurus, in nature "all takes place by necessity."²⁴ For Plato, natural science is only a "likely story" because the certainty of an account can be no greater than that of the things described.²⁵ Yet within the mechanism of nature, the machinery of the human mind is capable of imagining Platonic forms, and fabricating the fiction of "possibility" or

²² Because only two of four relevant factors are taken into account in the present discussion.

²³ Plato, *Timaeus*, 28A ff.; Epicurus, "Letter to Herodotus," in Diogenes Laertius, *Lives and Opinions*, x. 40.

²⁴ Here Leucippus differs from the Epicurean interpretation.

²⁵ *Timaeus*, 29D.

"freedom" in its Platonic sense.²⁶ Within the Platonic natural order, too, there is a way to include the atomist's illusion of discontinuity as a fiction.²⁷

3. *Location.* The atomist provides an "empty space" as the locus of his atoms; the Platonist has a dynamic "receptacle" with action diffusing through the whole field.²⁸

4. *Time.* Time tends to be made up of "moments" for the atomist; for the Platonist, it is referred to organic transformations.²⁹

5. *Infinity.* Infinity is actual for both, but in opposite senses. For the Platonist, the continua of fields are infinitely divisible; for the atomist, the sets of discrete particles are transfinite and infinitely extendable.³⁰

6. *Mathematics.* For the atomist, if he does not advocate a "finitist" geometry, mathematics deals with the properties of a "pure continuum" which nowhere exists in nature; for the Platonist, mathematics discovers the properties of actual entities.³¹

7. *Relation.* For the atomist, all relations are external; for the Platonist, internal.³²

8. *Explanation.* Explanation is by analysis into ultimate discrete elements for the atomist; for the Platonist, one explains by dialectical synthesis which discovers basic and pervasive math-

²⁶ Diogenes Laertius, op. cit., x. 142 ff., x. 67.

²⁷ *Timaeus* 43B ff. seems to explain this possibility.

²⁸ Epicurus in D. Laertius, op. cit., x. 40-42.

²⁹ Ibid., x. 47 for the atomic "moment" of time; in x. 72 there is a "subjective" concept of time, but this does not contradict its real atomicity. For Plato, see *Timaeus* 37D ff.

³⁰ *Timaeus* 53C ff., with Cornford's interpretation (*Plato's Cosmology*, 212-219). Epicurus, in D. Laertius, x. 42 ff.

³¹ *Timaeus* 47A ff.; for the character of this mathematics, see *Republic* vi. Contrast Epicurus in D. Laertius, x. 58-59, a passage very similar to Hume's criticism of geometry in his *Enquiry Concerning Human Understanding*; see also Heath, *Greek Mathematics*, I, 176-81, for a likely reconstruction of Democritus' view.

³² Contrast the "synoptic" vision which is the goal of Platonic education (*Republic* vii) with the Epicurean "clear impression" of a particular sensed object, which is the check of our knowledge (in D. Laertius, x. 38).

ematical forms in nature (and goes beyond this to still more basic axiological principles). Value is an ultimate category of explanation for the Platonist, a mere epiphenomenon for the atomist.³³

Transformations. If, prior to appraisal, transformation (1) is applied, the result is apparent contradiction as to the "facts" at every point. If, on the other hand, we use (2), Democritean "science" reappears as a true and relevant Platonic description of technology, on the level of opinion, while on the level of aesthetic construction, the Platonic metaphor and stress on togetherness give a legitimate account of the psychology and technique of the Democritean poet. Again, historically, we find philosophers of these groups puzzled or incensed by each others' views, which they appraise in the light of transformation (1). For example, one of the scandals of antiquity was the fact that Plato nowhere mentioned Democritus, presumably because he found no "philosophy" in the latter's view worth refuting or adopting. The Epicurean followers of Democritus do mention Plato, but dispense with his methods, doctrines, and ideas in short order. (The Epicurean "canonic" can almost be read as a method for avoiding any vestige of Platonism.) In the earlier portions of his *Metaphysics* and in his physical works, Aristotle, we have seen, dismisses Heraclitus and Anaxagoras, though later in the *Metaphysics* he does interpret the latter by transformation (2), and points out his contribution. The clearest case of return of this compliment is Whitehead's dismissal of Aristotle in the twentieth century; in the intervening periods, the tendency was rather to render Aristotle intelligible by "accommodation" through insisting that transformation (1) into Stoic, Augustinian, or Leibnizian terms gave the negative of Aristotle's "real meaning," or by using a system of appraisal more extensive than those assigned above to the "dynamic, emergent" family.

The assumption that (1) is a right transformation, rather than (2), is a natural one, yet it leads to results that are not credible. Repeated gross errors of simple observation are not likely to be made by men capable of the achievements of a Democ-

³³ Plato, *Republic* vi-vii; Epicurus, in D. Laertius, x. 54.

ritus, an Aristotle, or a Plato; and surely over two millenia, if such errors explained divergence of systems, philosophers of one group would have convinced those of the other.

The transformation (2) implies that differences trace back to fundamental divergence as to the character of "reality" and its gradation into "actual" and "possible." Philosophically, (2) is by far the better transformation. It permits us to plot the discoveries of philosophies with different orientations onto a single cosmographic map; and this is a major gain for philosophy, in part because each philosopher is more precise in his survey of what lies near his pole of "actuality." Platonic omissions in outlining technology can be supplied by atomistic analyses; and the atomist outlines a realm of poetry whose details Platonism provides.

There are several other interesting possibilities in this mapping, given a way of projecting divergent systems onto the common map (for instance, as in the present cases cited, by leaving ambiguous which direction represents causality, which represents motion toward actuality and which toward reality). In the first place, we can form a much clearer idea of where the present frontiers of philosophic exploration are, and of the regions that have been least adequately charted to date. (On the basis of some preliminary work, I am inclined to expect six relatively uncharted, four well-charted regions to appear.) In the second place, we can much more easily try to show what formal properties are common to all major metaphysical systems. In the third place, we can hope to suggest new insights to philosophers engaged in appraising alternative positions.

These possibilities are sufficiently exciting to justify a new attempt to realize the ideal of a comprehensive cosmography.

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CRITICAL STUDIES

MURE AND OTHER ENGLISH HEGELIANS

RICHARD KRONER

THE history of Hegelianism and in particular of English Hegelianism has not yet been written. If it is written eventually, the work of G. R. G. Mure will take an honourable place. In 1940 Mure published an *Introduction to Hegel* which is at the same time an introduction to his *Study of Hegel's Logic*, published in 1950.¹ This study represents a careful and penetrating commentary and a critical discussion. Before I review this book, a short survey of the development of English Hegelianism might prove desirable.

I

English Hegelianism was founded in a somewhat dramatic fashion by the romantic and explosive work of J. Hutchison Stirling, *The Secret of Hegel*, in 1865, which Mure finds "stimulating." Indeed it is stimulating to the extreme. It is even exciting, since it is written in a very personal and passionate style reflecting the immense struggle of the author with Hegel's system. In the beginning of the book he seems to despair of ever understanding or agreeing with the speculative thought he tries to grasp. Only in the course of ever new attempts and ever new trials does he finally succeed. While the book first gives the impression of an indignant and even furious opposition of the author to the dialectical movement, in the end he is seen to be not only reconciled to it, but to have become an almost fanatical disciple and defender of Hegel.

All subsequent English Hegelians were more or less influenced by this eloquent and enthusiastic manifesto. Although later generations were sometimes repulsed by the romanticism of this first

¹ *A Study of Hegel's Logic* (Oxford, The Clarendon Press, 1950). viii, 371 pp.

adept, they were persuaded that something great could be recognized in Hegel's rational theology. Indeed, I believe this theology attracted the English mind much more than did Kant's critical and negative attitude towards "natural theology." Stirling with his alarming and agitating proselytism awakened Hegelianism on the foreign soil; indeed, he eventually created a new type of English thought, more metaphysically minded than any of the typically English philosophers of modern times (perhaps with the exception of Shaftesbury who, however, was not a logical philosopher and could therefore not found a school comparable to English Hegelianism).

It is a striking fact that Hegel began to conquer the English soul and mind at a time when his influence in Germany had almost entirely died out. In Germany the wave of speculative metaphysics which had its high-tide in the first quarter of the century fell off completely in its middle. The bow of speculation was bent too much; the energy of systematic construction was seemingly spent and exhausted. A reaction followed which is manifest in the cry: Back to Kant! The English nation, on the contrary, had just discovered the fascination and persuasive power of Hegel's high flight into the lofty sphere of the Absolute. Like a young and adventurous seafarer, Stirling gave the signal: full steam ahead! And now "old England, the spiritual, Platonic old England," as Coleridge had called it, awoke again and generated a group of scholars who began to study and to set forth the system of the great dialectician.

The first in the series of works on Hegel was the book of W. Wallace, *Prolegomena to the study of Hegel's Philosophy* (1873, eight years after *The Secret of Hegel*). And in 1876, Francis Herbert Bradley, the most powerful and the most profound of all the English Hegelians, published his *Ethical Studies*, the first work to apply Hegelian principles to the problems of ethics in an independent, creative way.

By far the most important and most ambitious attempt at a metaphysical system dealing with all the fundamental and traditional schemes of this much encumbered and most problematic of all sciences, the magnum opus of Bradley, is *Appearance and Reality*, published in 1893.

It would be difficult and risky to make a brief statement about the relation between Bradley's English Hegelianism and Hegel himself. May it suffice to say that Bradley is an original thinker who blended, in a most peculiar and individual manner, traits of English philosophy, especially a kind of empiricism, with a dialectical and speculative metaphysics. In the preface of his eminent work he says: "I have written for English readers and it would not help much to learn my relation to German writers. Besides, to tell the truth, I do not know precisely that relation myself . . ." —a typically English remark in its honesty and modesty, but also in its self-assurance and pride.

The second self-dependent figure in this group is Bernard Bosanquet. (I do not mention Thomas Hill Green, not because I do not esteem him highly—I do! But he does not belong properly to English Hegelianism, since his most significant book, *Prolegomena to Ethics*, is more Kantian and Fichtean than Hegelian; besides it was published only posthumously in 1883.) Bosanquet was not as original as Bradley, but the scope of his interests was wider. His philosophy covered almost the whole range of culture. He stressed especially the "value and destiny of the Individual," to quote the title of the second series of his Gifford Lectures (1913). Both Bradley and Bosanquet wrote systems of logic partly based upon the logic of Hegel.

The third thinker in this group, though about twenty years younger is John M. E. McTaggart (1866-1925). In him the school begins to dissolve or to deviate so far from Hegel that it can hardly be called Hegelian any more. But in his earlier period McTaggart is still a student of Hegel's system and eager to expound it. Mure, who obviously has learned a lot from Bradley and Bosanquet—he compares their thoughts on logical problems with those of Hegel—says about McTaggart: "I must confess that I have never seemed to find inspiration or guidance in any work of J. E. McTaggart on Hegel." I wonder why he did not; I myself learnt much from his book *Studies in the Hegelian Cosmology* (1901), especially about the transition from mechanism and chemism to organism and life. But it is true that McTaggart was always more rationalistic, in the pre-Kantian sense, than the other Hegelians, and that

he finally (in his posthumous work *The Nature of Existence*) stiffened in this attitude to the utmost.

In the 20th century English Hegelianism was no longer as productive and as original as it had been in the "classical period" from Stirling to McTaggart. Nevertheless Hegelianism is not dead in England and may resuscitate at any time. I could name a number of thinkers and scholars who upheld the tradition in our century, some amongst them of no small rank. I will mention only Sir James Black Baillie, who wrote *Origin and Significance of Hegel's Logic* (1901), and John Alexander Smith, who was still an enthusiastic Hegelian in his work *Philosophy as the Development of the Notion* (1925). The last remarkable Hegelian in our time was the Oxford professor R. G. Collingwood, a man of genius, who died all too young. He was both an historian and a philosopher, and he tried to unite these two sciences in a way reminiscent of Benedetto Croce, whom he highly admired. Other men turned away from Hegel more or less overtly, for instance Andrew Seth (Pringle-Pattison), who denounced the lack of appreciation of the human personality in Hegel's system, and offered instead a personalistic theism.

II

At present probably the most remarkable amongst the Hegelians is G. R. G. Mure. The study of Hegel has entered a new phase with him. It is now more correct, goes more closely into Hegel's own arguments and is at the same time more critical than was the older Hegelianism. Mure stands on the shoulders of his predecessors whose works he knows and continues. He has written what probably amounts to the best commentary ever composed about Hegel's logic. It holds a wise middle ground between an arbitrary interpretation, disregarding the spirit as well as the letter of the master, and a slavish repetition or imitation of Hegel's words. Mure is himself a thinker on his own, but in this book he follows loyally the trend of Hegel's logic and illuminates it in many ways. He philosophizes in a lively fashion about Hegel's position and argumentation; he compares Hegel's doctrines with

those of the past, especially with Aristotle, occasionally with those of Plato, Kant, Fichte, and the English Hegelians.

There is another valuable feature in his commentary. Mure uses both the so-called greater logic and the smaller account of this science as offered by Hegel in his *Encyclopedia*. He uses now the one, now the other, according to what he thinks is the value or the clarity of the one or the other version of Hegel's logical doctrine. He makes however almost no use of the newer publications of Hegel's earlier versions of his system.²

Mure considers in a most instructive way in what sense Hegel is an Aristotelian and in what sense a Kantian. Indeed, it is the meeting of these two great thinkers which originated a new metaphysics in Hegel's mind. One might say that Hegel renewed the motives and even the principles of the Aristotelian metaphysics, which is predominantly ontological and theological, on the level and with the intellectual instruments of Kant's Transcendental philosophy, which is predominantly epistemological and ethical. It would be hard to decide which of his outstanding predecessors is more influential in his system, so completely blended are they. It is in this sense, I suppose, that Mure calls Kant the "father" of German philosophy, although he knows certainly that not Kant, but Leibniz (or farther back Eckhart or Cusanus) deserves this epithet. But it is necessary to emphasize, as Mure does, that Hegel "owes a real debt" to Kant, since there is a fashion in some quarters today to overstress the originality of the Hellenic feature in Hegel's system at the expense of his Kantianism.

It is no easy task to state correctly the relation between Hegel and Kant, and Mure does a good job of it.³ Hegel deviates from

² I refer especially to the edition of the first draft of Hegel's logic, written when he was a professor in Jena, and published out of the manuscripts by Georg Lasson (1923) in *Hegels Sämtliche Werke, Kritische Ausgabe*, Bd. XVIII, Verlag Felix Meiner (now in Hamburg, formerly in Leipzig).

³ I wonder, however, why he does not make more use of more recent German work. He mentions Kuno Fischer, whose writings are now antiquated, and Marcuse, who is a Marxist, but completely ignores the large literature on Hegel which appeared in the first half of the 20th century, during the "Hegel-Renaissance." He also entirely ignores the very valuable studies made in the Netherlands, where an Hegelian school flourish-

Aristotle just insofar as he agrees with Kant. He is convinced that the key to the understanding of Being and Becoming is the activity and spontaneity of the thinking mind. Although Hegel's logic is not epistemological in the same (finite) sense in which Kant's transcendental logic is epistemological, it is still a logic of cognition, and therefore culminates in the idea of cognition which prevails in the absolute idea. Ironically enough, this primacy of the theoretical element of the Idea as compared with its other element, namely the Good, is not Kantian but rather Aristotelian—so complex and entwined are historical relations, if abstractly taken! Hegel's logic is no longer ontological in the way the logic of Aristotle was; rather it is ontological only insofar as the ontic is rooted in thought. It is ontological not in the sense in which metaphysics had been so before Kant, but in a radically new sense made possible only by Kant.

Hegel's logic is metaphysical not in the naive way of Aristotle, who was convinced that Being and Thought agree because knowledge of Being would be impossible without such an agreement. Rather, Hegel's logic undertakes to prove that such an agreement exists by moving from Being to Thought within the medium of thought, from the Immediate to the Mediated through mediation, so that the agreement between Being and Thought grows out of the act of thinking itself. Mure shows this contrast most strikingly in dealing with Aristotle's central logical doctrine: syllogism. According to Aristotle, a syllogism is valid because the world of substances and processes is syllogistically arranged. According to Hegel, a syllogism is valid because it is an integral constituent of the movement of thought itself, or because it ultimately leads to the self-understanding of the universal mind.

ed in the "Genootschap voor zuivere rede" with its own journal: *De Idee*. Penetrating essays appeared in this journal. Also, in Italy, not only Croce whose position Mure analyzes, but other Hegelians even more worthy of study—e.g., Giovanni Gentile—continued in a creative way the Italian Hegelianism of the 19th century. And most recently French scholars have contributed valuable writings dealing with the exegesis of Hegel's metaphysics. Mure says "the most complete bibliography I know is Croce's, although it is more than thirty years out of date"! He seems not to know that many really complete bibliographies have been published in the meantime, not "out of date."

Hegel thus unites Aristotle and Kant by an ingenious stroke. He unites the two aspects of metaphysics relatively separated in Aristotle: the ontological and the theological. Or to put it differently: he transforms Aristotle's divine reason into a transcendental subject. But he also transforms Kant's transcendental subject into a divine reason. In this way Hegel transforms transcendental logic into a dialectical ontology and vice versa. By this double transformation metaphysics takes on an entirely new and powerful character. This stroke of genius solves the problems which were insoluble within the system of Aristotle and vainly treated by the medieval Aristotelians: how the divine mind creates the finite forms of things in the world, and how the finite mind depends upon the divine mind. In other words, it tackles for the first time the difficulty of combining Aristotle's dualism with the idea of Creation.

Hegel's ingenuity is, however, not confined to this great synthesis of elements seemingly incompatible and never before reconciled to each other. Mure does not see that there is also a profoundly aesthetic trend in Hegel's system, instilled and incited by the enormous impression which Goethe's *Weltanschauung* had made upon all the thinkers around 1800. This point is the more important, because the Greek mind, also, was deeply fashioned by the artistic spirit of a culture which found its most eloquent and most Hellenic philosophic expression in the system of Aristotle. Indeed, the reconciliation of Aristotle and Kant was at the same time a reconciliation of the otherwise obviously contrary views of Kant and Goethe. The view of the poet was determined by his great intuition of nature as having a polar unity. Opposites like form and content, outer and inner, subjectivity and objectivity, infinite and finite, collaborate, according to Goethe, to bring about a universal unity of the world. This aesthetic view offers a vital and substantial basis for all that Hegel thinks and says. It is at the bottom of his dialectical synopsis. It is the moving soul, the very dynamics of the system and so also of his logic.*

* This aesthetic trend betrays itself in a manifold way. It appears, for instance, when Hegel calls the movement of the Notion a "play." Mure misunderstands the aesthetic motif of this expression and tries to attenuate

Mure wishes to "offer a clue rather than an epitome" of the doctrine of Essence (90). I think this statement can be enlarged to cover his whole treatment of Hegel's logic. He has, indeed given us the clue to this work. (He is modest enough to admit that Hegel's words are often obscure and remain so even if one studies them intensively.⁵) What he has to say about the relation between Hegel's doctrine and the *Critique of Judgement* is very helpful. He seems to value most the third part of the logic which deals with the Notion.⁶ I agree with him that this discussion or movement is the most important one, and the clue to Hegel's logic—a truth not enough appreciated by earlier commentaries. The whole logical movement is that of the Notion. The third part therefore contains the self-understanding of the whole. All the problems of the earlier stages and all their solutions return on this ultimate level and are only there finally and definitely expressed.

III

Mure's work is not only a commentary; it also contains a critical analysis of Hegel's doctrine and position. Collingwood and Croce apparently have influenced him in his own position. This position, however, is only negatively carried through by showing that Hegel's metaphysic cannot be upheld.

It is a little awkward that the very beginning (the first chapter) and the four last chapters deal critically with Hegel's logic. Obviously language plays a rather fundamental part in Mure's own philosophy. That is why he begins by discussing the problem of language with respect to Hegel's logic. "Philosophical thought is an incomplete synthesis of language with thought" (22). This statement is in itself a critique of Hegel's undertaking,

what has to him a shocking sound by interpreting it as meaning an "utterly unhindered activity" (158).

⁵ So he says, e.g., "The dialectic in the large logic is to me (in this phase) highly obscure . . .," or, "I am doubtful (in the case of chemism) how far I have understood Hegel's doctrine. . . ."

⁶ He writes 137 pages on this part and only 87 pages on the first part (Being), while the German text (1833-34) covers 409 pages on the first and 353 pages on the third part.

since Hegel is convinced that this "synthesis" can be complete and is most complete in the logic. In one passage Mure goes so far as to assert that "language is logically prior to thinking" (96). This thesis is not only contrary to Hegel's intention; it seems to me incorrect.

Had Mure said that language precedes thought not only in an historical or genetic, but also in a spiritual sense, I could understand his thesis. Thought has to be expressed and can be expressed only in a language which is determined by a definite spirit. But such a determination should not be called a "logical" priority. Logically nothing can be prior to logic. Logic is not permitted to recognize any logical presupposition in its own domain. I hold that Hegel is right on this point. Logic has to develop whatever is logically valid, i.e., valid within logic itself. Logic is therefore the logically first of all philosophical disciplines. But would it not be necessary in consequence of this principle to begin *ab nihilo*? In a way Hegel is doing precisely this, since Being turns out to be Nothing, if understood in a purely logical fashion. Hegel begins from Being and not from Nothing, because he presupposes not language, but the *Phenomenology of Mind*, a fact completely disregarded by Mure.

In the last chapters Mure discusses in an independent manner the problem of space and time and that of the empirical factor in reality and thought, and finally, "the scope and limitations of a dialectical philosophy" with special reference to Croce and Marx. He argues convincingly that those problems are not only unsolved by Hegel, but that they threaten to destroy the whole edifice of his system. In a less systematic and conclusive system it might be possible to attack some bastions without undermining the fortress itself, but in a system as round and perfect as Hegel presumes his to be, even a minor criticism leads eventually to the breakdown of the proud architecture in its entirety.

This is particularly true with respect to the relation between the empirical and the *a priori*, or between the non-philosophical and the philosophical sciences. Indeed, this relation is the weakest point in the system, and thus it was an event of historical justice that the system collapsed when the natural and the historical sciences unfolded all their power in the 19th century. "A

flawless philosophical dialectic is not possible," Mure consequently sums up his criticism (331). "The inherent duality of human experiences is the rock on which Hegel's system . . . suffers total shipwreck" (332). The idea of freedom and of the individual, the problems of history and of art, withstand the constructive creativity of the great system-builder.

What then is the final conclusion to be drawn from Mure's penetrating and conscientious analysis? I think it is very much akin to the historical event that took place in Germany in the middle of the 19th century. Of course, it would be foolish to recapitulate the historical return to Kant. But is it not true that Kant more than Hegel did justice to those unsolved problems, that the idea of freedom has a better right in Kant's critical philosophy than it has in the all-embracing Absolute which develops out of its own inner necessity towards its own fulfilment? Indeed, Mure instinctively has recourse to the Kantian phrase, when he says: "Totality is a never fully realizable ideal" (353).

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THE CHALLENGE
OF THE HISTORY OF SCIENCE:
PART I

JAMES C. HADEN

I

THE emergence of the study of the history of science as a self-subsistent discipline, claiming both to enrich our knowledge of cultural history and to interpret the nature of science to the non-scientist, proposes an unparalleled opportunity for and challenge to the historian of philosophy. No one can claim a superior ancestry; the Greeks practised both disciplines.¹ Even in more recent times, the two run approximately parallel. The end of the 18th century—that age of prize contests, public libraries, and dictionaries, of explosively growing knowledge of nature—saw the publication of Montucla's history of mathematics and astronomy,² and Tiedemann's history of philosophy.³

The watershed for the latter discipline was the establishment of the Hegelian philosophy, with its thesis that the history of philosophy was philosophy itself. Hegel's lectures on the history of philosophy appeared posthumously⁴ but his influence was already confirmed. The first really inclusive history of science which is of more than antiquarian interest, William Whewell's *History of the Inductive Sciences*, was published almost simultaneously in 1837. For Whewell as well as for Hegel, history and philosophy were connected; Whewell's *History* was written in close relation to

¹ Besides the familiar doxographers, one of Aristotle's pupils, Eudemus of Rhodes, wrote histories of arithmetic, geometry, and astronomy in the 4th century B.C.

² Paris, 1st ed., 1758; 2nd ed., completed by Jérôme de la Lande, Paris, 1799-1802.

³ Dieterich Tiedemann, *Geist der spekulativen Philosophie* (Marburg, 1791-1797).

⁴ Berlin, 1833-1836.

his *Philosophy of the Inductive Sciences*,⁵ which he in one place called the "moral" of the other work. Surveying the astonishing advances of science, especially in the previous century and a half, he expressly aimed to clarify the method responsible for them. Philosophically, he was a curious hybrid between Kant and Francis Bacon, seeing in scientific development the progressive articulation of certain *a priori* "Ideas."⁶ But despite these early and vigorous beginnings, the study of the history of science has generally lagged behind that of its sister study, perhaps because the impetus of scientific expansion and specialization has discouraged scientists from examination of their own intellectual antecedents, and at the same time has debarred non-scientists from sufficient technical understanding to perform the task adequately. The edges of the old wound between the *Natur-* and the *Geisteswissenschaften* healed apart rather than together, to the detriment of both.

Science is predominantly active, philosophy reflective. Therefore it is plausible and necessary for the working scientist to attend more to the application of ideas than to the ideas themselves. For him the expansion of a scientific idea into a universal concept is secondary, to be done after the idea has been tempered in the stream of particular fact, if at all. The tendency of philosophy to a more abrupt achievement of an explicit world-view, while usually done by generalization of specific insights originating in limited areas of thought, brings it immediately into the crowded arena of universal schemes where it must exercise great sensitivity to diverse demands. A scientific concept is often hobbled by unawareness of the richness of the realm of conceptual possibilities from which it was generated. A philosophic concept fails when it overreaches itself and in trying to reconcile conflicting demands at any cost, desensitizes itself and imposes a pre-determined form on alien content.

When one examines the trends in both the history of philosophy and the history of science, one notices in each a turning

⁵ *The Philosophy of the Inductive Sciences, founded upon their history* (London, 1840).

⁶ For further information, see C. J. Ducasse: "Whewell's Philosophy of Scientific Discovery," *The Philosophical Review*, LX (January, April, 1951).

toward the other. Philosophy realizes more clearly that its past cannot be fully understood without attention to the demands of the scientific mode of thought in all ages, and science is coming to see that its assertions will be less brittle if it can view itself as an activity with peers and not merely subordinates. The study of the history of science in this way becomes broadened to include philosophy, and the history of philosophy takes a new interest in aspects of the history of thought which it had traditionally slighted. Having been formulated as a distinct discipline under the Hegelian aegis, one unresponsive to the characteristics of science, and traditionalized more and more firmly during the period of the divorce between science and philosophy, the history of philosophy now needs a thorough re-examination and revision.

II

Since the study of the history of philosophy has grown faster than that of the history of science, it has had an opportunity to explore certain formal techniques which historians of science are now retesting. The basic problem for both is the most effective utilization of a vast mass of material—more material than can ever be included in any one whole. The eternal tension is between knowledge and wisdom: knowledge of fact, and wise selection from that matrix. The stark necessity of this limitation leads to certain classic forms, which differ fundamentally according to whether they stress compartmentation or continuity. The dominant form in the history of philosophy is the use of individual thinkers as the unit of presentation, and the arrangement of these into schools and finally into chronological order. Attempts such as Wilhelm Windelband's⁷ to make developing ideas the unit have not set a general pattern. In the history of science the reverse is the case. There it is most fruitful to base exposition on ideas rather than men, although the example of philosophy may have misled some writers in the field. It may be

⁷ In his book *A History of Philosophy with Special Reference to the Formation and Development of its Problems and Conceptions* (2nd ed., New York, 1901), which is now fortunately back in print.

that the natural difference in form reflects a difference in the nature of the activities studied; philosophies tend to be distinct, organic wholes, while science is the perpetually unfinished work of many, frequently obscure hands. Yet in both fields there is undeniable interfusion of the two forms, and it is the prime task of either kind of history to show this, with such difference of emphasis as is necessary for their separate ends.

The unlimited opportunity for discovery in the history of science, together with its intrinsic interest and importance, has spurred continuously increasing research and writing on the subject. Its extrinsic importance as a relatively non-technical and humanistic approach to the nature and method of science has also fostered a freely growing number of books. The sphere of relevance for the study of the history of science has expanded, chiefly under the influence of George Sarton, until it includes such diverse topics as religion and education as well as philosophy. It is imperative that those genuinely concerned with the history of philosophy contribute toward the stabilizing of the other discipline along lines which strengthen both. From the side of science can come the emphasis on continuous threads of conceptual development; from the side of philosophy can come the fullness of experience in the objective assessment of individual doctrines. This is not to deny to the history of science its own domain; its growth seems to be one of the most heartening and promising signs for the humanization of science which has yet appeared. But to be autonomous is not to be unrelated, and a too-early departmentalization and hardening of the history of science will surely cripple its effectiveness.

There have been, to be sure, previous manifestations of a desire to bring the two disciplines together^{*} but the union has proved mainly infertile. The outstanding exceptions are those for whom, to paraphrase Hegel, the history of science is philosophy itself: Whewell, who has been mentioned already, and more recently Ernst Cassirer or A. N. Whitehead. The very diversity of philosophies which these names represent, however, may

^{*} For example, note the full title of William Dampier's history of Science (below, p. 85).

indicate that a good deal of patient elaboration of detail and partial interpretations must take place before we have a reasonably confident resolution of the controversy. The transfiguration of the history of science which comprises the early chapters of *Science and the Modern World* may well stand as a model, in form if not in substance.

III

The name of George Sarton is one of the best-known in the small band of top-ranking historians of science. Coming to an awareness of the importance of scientific history from the standpoint of a student of science itself, he began his work before the first World War, emigrating to America when his native Belgium became embroiled in the struggle. He is the founder and present or former editor of the outstanding journals in the history of science, *Isis*⁹ and *Osiris*.¹⁰ Both are equally scholarly and invaluable, but the latter is the more sedate. It is actually a series of memorial volumes containing solely papers in the history of science, sometimes of a considerable length. In contrast to *Isis*, *Osiris* includes no ephemerae such as book reviews, personal notes, correspondence, and the like. *Isis* is the official organ of the History of Science Society, an expanding international organization with many active local chapters, but more than that, it is a living and flexible appendage of Sarton's monumental *Introduction to the History of Science*.¹¹ This work, by which Sarton's name is widely known, is an enormous thing, even though compressed to its lowest limits. It is emphatically not for continuous reading,¹² being intended as a work of reference covering the

⁹ *Isis: International Review Devoted to the History of Science and Civilization*. Founded by George Sarton, edited by I. Bernard Cohen. 44 vols., 1913-1953. There are other good journals, such as *Revue d'Histoire des Sciences et de leurs Applications*, an organ of the Centre International de Synthèse, History of Science section.

¹⁰ *Osiris: Commentationes de scientiarum et eruditionis historia rationeque*. George Sarton, editor. 10 vols., 1936-1952.

¹¹ George Sarton, *Introduction to the History of Science*, 3 vols. in 5 (Baltimore, 1927-1948). Hereafter cited as *Introduction*.

¹² Except for the introductory essays.

history of science through the 14th century. Sarton has announced that he will work no more on it, but as a testimony to its pioneer character and to the continuing researches which have stemmed from Sarton's influence, frequent revisions and additions are made to it. Since it is clearly impractical to reissue the volumes separately or together (each of the five parts averages over 800 quarto pages), changes are noted in *Isis*. There one finds published also queries on obscurities and uncertainties, so that any reader able to shed light on them may do so. Sarton has made of the study of the history of science the cooperative labor that science itself is.

Sarton has now begun to publish further fruit of his years of lecturing on the history of science at Harvard; he plans a massive eight-volume narrative history of science, intended for general use. The initial volume is now available¹³ and it bears his unmistakable stamp. Among other skills, Sarton is adept in the art of the essay, the offspring of learning and modesty. Few can, with such innocent aplomb, remark in passing: "That reminds me of a saying of the Nestorian monk Simon de Taibutheth, who flourished somewhere in Syria or in Iraq about the end of the seventh century . . ." ¹⁴ Further, since he stands in such a peculiarly eminent position he cannot take refuge under orthodoxy's cloak of invisibility, and it is this intensely personal quality of his viewpoint which vivifies so much of his work. Too often the vigor of intellectual history is leached away by a lesser writer, through a pretense at detachment ill-supported by learning, or by fear of offending a potential critic.

This is certainly not the case with Sarton. His faith is that of the liberal humanist who consciously attaches values to historical facts and events. Science, representing the high point of man's control over his environment, is therefore pre-eminently worthy of respect. He has stated his faith repeatedly in such terms as these: ". . . three unities—the unity of nature, the unity of science, and the unity of mankind—are but three different visages

¹³ George Sarton, *A History of Science*, Vol. 1 (Harvard University Press, 1952). Hereafter cited as *History*.

¹⁴ See *The Saturday Review*, XXXV, 39, p. 36.

of the same unity . . . human progress . . . is the gradual transformation of that potential or hidden unity into an actual unity, one that all can see and no one deny."¹⁵ And ultimately his expression of faith is quasi-theological: "The history of science is the history of mankind's unity, of its sublime purpose, of its gradual redemption."¹⁶

The advantages of Sarton's approach are numerous, as already indicated. On the other hand, it perennially runs the risk of reflecting personal crotchets, and also the crotchets of humanism itself. In this case these peculiarities are not especially frequent in treating scientific figures, but appear in other contexts. Probably the most outstanding instance is the extended discussion of Plato. If it concerned some neglected scientific writings, Sarton would have bent painstaking efforts to examining the original material and providing a fresh and direct interpretation of its significance and value. But here he acknowledges his reliance on Warner Fite and the weirdly matched pair, Benjamin Farrington, the Marxist, and Karl Popper, the bitter anti-Marxist.¹⁷

Plato is close to being the King Charles's head of humanist thought, and needless to say the estimate here is that he was nothing short of a universal catastrophe. In his "crazy commonwealth"¹⁸ Plato asserted the "absolute supremacy of the state," and the state as such is identified with the ruling class.¹⁹ Between the rulers and the ruled there is no "temporary difference of class or function, but . . . a permanent difference of race or caste,"²⁰ and an "unbridgeable abyss."²¹ The "elite was a natural elite, it existed, all that was needed was to strengthen and unite it . . . One should begin with a good stock and breed men as one breeds cattle. Again one can but wonder at Plato's naïveté. . . Plato himself could easily have named many aristocrats who were utterly

¹⁵ *Introduction*, Vol. I, p. 31.

¹⁶ *Ibid.*, p. 32 For Sarton's humanism see also "George Sarton: Historian of Science and Humanist" by William H. Hay, *American Scientist*, XLI (1953), pp. 282-85.

¹⁷ *History*, p. 408, note 25.

¹⁸ *Ibid.*, p. 413.

¹⁹ *Ibid.*, p. 411.

²⁰ *Ibid.*, p. 410.

²¹ *Ibid.*

unreliable and contemptible." ²² And so on. The crowning insolence on Plato's part, of course, was advocating the "noble lie" ²³ for the preservation of the supremacy of the elite. Sarton's own naïveté is to be wondered at; he nowhere makes reference to the definitive discussion of this dispute given by F. M. Cornford, ²⁴ who resolves it in Plato's favor.

Apart from his influence on subsequent political thought, Plato is also held responsible for centuries of scientific obfuscation, thanks to the *Timaeus*, that "monument of unwisdom and recklessness." ²⁵ Sarton "cannot mention any other work whose influence was more mischievous, except perhaps the Revelation of St. John the Divine." ²⁶ Moreover, Plato is held accountable for all sorts of number mysticism and other "astrologic nonsense," ²⁷ possibly because of his tendency to use myth as a vehicle for philosophical exposition. The passage in which Sarton refers to the myths is curiously garbled: "... the myth of Atlantis at the beginning of the *Republic* and the myth of Er at the end of it . . ." ²⁸ (but Atlantis is later put back where it belongs ²⁹).

The overriding mistrust of Plato and all his works issues in all sorts of adverse secondary judgments. He is grudgingly admitted to have had a good prose style, but this is offset by the opinion that it has been praised mainly by people who are too ignorant of Greek to pass proper judgment. Therefore "admiration of Plato's style by incompetent people is a curious form of snobbishness. . . ." ³⁰ So the common reader, with no Greek, is too embarrassed to enjoy the Dialogues. Even more startling is a serious effort to elevate Xenophon to superiority over Plato. Evidently with Plato in mind, Sarton says Xenophon handles Attic

²² Ibid., p. 412.

²³ Ibid., p. 417.

²⁴ See the essay "The Marxist View of Ancient Philosophy," in *The Unwritten Philosophy and Other Essays* (Cambridge, 1950).

²⁵ Sarton, *History*, p. 420.

²⁶ Ibid., p. 423.

²⁷ Ibid., p. 421.

²⁸ Ibid., p. 405.

²⁹ Ibid., p. 422, n. 69.

³⁰ Ibid., p. 408.

prose with "consummate art."³¹ Plato suffers by comparison of personalities as well; he is "doctrinaire, dogmatic to the point of inhumanity."³² Xenophon is "affectionate and goodhearted," moderate, "conservative," full of "simple piety," "practical and earthbound, more interested in good recipes than in principles,"³³ a solid country squire and "paterfamilias." In short, "Xenophon was a soldier and farmer, while Plato was a professor . . . we can hardly imagine Plato except in the gardens of the Academy discussing philosophy and mathematics, quarreling with his colleagues and disciples."³⁴

The fact that Xenophon was a husband and father, while Plato was a confirmed bachelor is of sinister significance, since earlier Sarton has made an extended plea that Plato was "almost certainly homosexual."³⁵ What amazes Sarton is the hypocrisy of the "schoolmasters," who deliberately make themselves "blind to his ideas on communism and catamiting, to his lack of respect and tenderness for women. . . ." ³⁶ And finally, the spirit of science is invoked: "Theologians and philosophers may gloss over his aberrations, but for men of science that is the unpardonable sin."³⁷ Yet Sarton does not seem to find any discrepancy between admiring the Greek *kouroi*, statues of nude young men, and shuddering at every statement of the Platonic Socrates concerning beautiful youths. When all else fails, the resort is to innuendo.³⁸

The attempts to discredit Plato are so numerous that they cannot be documented fully here. Although the comparison is a little incongruous, one is reminded of the way T. H. Huxley liked to send a surly essay snarling after the Salvation Army. Plato's ruling defect is held to be his lack of humanity, which clearly exposes Sarton's yardstick. There is a disturbing gap between this *a priori* humanism and Sarton's insistence on adherence to

³¹ Sarton, *History*, p. 455.

³² *Ibid.*, p. 462.

³³ *Ibid.*

³⁴ *Ibid.*

³⁵ *Ibid.*, p. 425.

³⁶ *Ibid.*, p. 427.

³⁷ *Ibid.*

³⁸ *Ibid.*, p. 427, n. 86. It is genuinely saddening to find Platonic love linked with charges of homosexuality in the State Department.

"tangible facts, objective, impartial, and controllable knowledge" ³⁹ and rejection of "scholastic argumentation." He recoils before Eddington's *a priorism* in science, ⁴⁰ but apparently abhors it less in philosophical assessment.

The danger is not so much that this maltreatment of philosophers will taint Sarton's statements on science, but that among the book's most likely public—laymen, and professionals and amateurs of science—ignorance of philosophy will permit the excellence of the exclusively scientific portions to persuade them of the accuracy of the other. This is why it is worth looking at his handling of Plato in some detail. Sarton is a man with a vision of the mission of the historical study of science, but one can accept the vision and simultaneously reject the constraints of his specific brand of humanism. The latter in fact bars just that full demonstration of the unity of human endeavor in which he so warmly believes. It is always disheartening to see how readily humanistic warmth can turn into heat, and how the earnest desire to affirm positive goals for humanity can be transformed into bitter denial of unsympathetic ends.

IV

Sarton's *History* is conceived on a typically grand scale, and as a result it tends to fall into self-subsistent parts. It is not always easy for the reader to preserve a sense of continuity and to focus his attention on the emergence of any given scientific concept. Another recent book, *The Growth of Scientific Ideas*, ⁴¹ seems to give promise of rectifying this. The author, W. P. D. Wightman, says that his book "makes no claim to be another history of science, but (is) a guide to the study of development of scientific thought as illustrated by a few dominant ideas." ⁴² Its primary division, creating the two halves of the work, is into sciences of inorganic

³⁹ George Sarton, *A Guide to the History of Science* (Cambridge, 1952), p. 60. Hereafter cited as *Guide*.

⁴⁰ *Ibid.*, p. 38.

⁴¹ W. P. D. Wightman, *The Growth of Scientific Ideas* (Yale University Press, 1951). Hereafter cited as *Growth*.

⁴² *Ibid.*, p. vi.

and organic nature; it is secondarily divided by particular sciences. It is clear that Wightman has made an effort to carry out his purpose, but only occasionally, as in the chapter on Ampere ("The Newton of Electricity") and in the one on spectroscopy and the analysis of matter ("From Coloured Flames to Star Stuff"), does he come near success in showing the true dynamism of scientific ideas. There are several reasons for his overall failure; one is his lack of a clear, incisive prose style. This book is better written than his *Science and Monism*,⁴³ but it still suffers from an awkwardness, at times bathetic and frequently obscuring the structures of ideas instead of revealing them. Truly clear writing comes from full assimilation of relevant material so as to enable deft exclusion of confusing issues. In such a field as this, with its swollen mass of detail, such thoroughness of conceptual mastery is indispensable.

Though he disclaimed the intent of writing a history of science, Wightman has nevertheless tried to take in such a wide area that the reader does not find his understanding of the activity of science and the scientific way of thinking materially increased. If one is interested in scientific concept formation as such, two or three different concepts would have sufficed. The emergence of such concepts can be made perfectly clear and understandable within the Greek period or the 17th century alone. Yet Wightman devotes only 33 out of almost 500 pages to science prior to 1500—so little that his back references in later chapters to Greek thought are virtually unintelligible. His interest and sympathy are clearly not there. In his view the Democritean system was the "final answer" ⁴⁴ of the whole of Greek science to the question "What is the stuff of nature and how is it ordered?" He flatly announces: "We shall at once agree that this system is the summit and perfection of Greek physical speculation." ⁴⁵ This enthusiasm, more characteristic of the Marxist interpretation of Greek science,⁴⁶ arises from one of Wightman's evaluative criteria, namely, the

⁴³ London, 1934.

⁴⁴ *Growth*, p. 29.

⁴⁵ *Ibid.*, p. 27.

⁴⁶ E.g. Benjamin Farrington's and George Thomson's.

question: "How far does it (a historical scientific concept) satisfy us—that is, to what extent was (this) answer a *real* answer?"⁴⁷ This trust in the present as the custodian and arbiter of reality can lead to serious flaws in estimation if not carefully qualified; it probably is the root of Wightman's desire to cover too much—by themselves the older concepts are false and hence uninteresting, while the modern concepts are unintelligible in isolation, so that both must be included. We can use Plato as a convenient touchstone here also; the case of Democritean versus Platonic atomism is a good test of a historian's assessment of the particle concept untroubled by adventitious factors. Wightman does not mention Plato's atomism.

Despite all its faults, the book is suggestive enough to make one wish it were better, and perhaps it may serve to point the way to a more satisfactory work, fulfilling the aim Wightman set himself. But to accomplish it will require a more stringent form and discipline than Wightman's book displays.

The Growth of Scientific Ideas, as a general one-volume work in the history of science, invites comparison with Einstein and Infeld's excellent book *The Evolution of Physics*,⁴⁸ and with books like Dampier's *A History of Science*⁴⁹ and Charles Singer's *A Short History of Science*.⁵⁰ By conscious limitation to the basic concepts of the particle and the field, and by showing clearly how scientific conditions shaped their modern form, Einstein and Infeld achieved what Wightman generally fails to do. They have set a high standard for works of this kind.

The Dampier and the Singer general histories are probably still the most useful examples of their kind. Singer in particular is unique for having written a good survey of science in under 400 duodecimo pages. This is possible in part because he minimizes his account of the development of mathematics and also

⁴⁷ *Growth*, p. 8. Wightman's italics.

⁴⁸ A. Einstein and L. Infeld, *The Evolution of Physics: The Growth of Ideas From Early Concepts to Relativity and Quanta* (New York, 1938).

⁴⁹ William Cecil Dampier, *A History of Science and Its Relations with Philosophy and Religion* (New York, 1929, 4th ed., 1949).

⁵⁰ Charles Singer, *A Short History of Science to the Nineteenth Century* (Oxford, 1st ed., 1941, 2nd ed., 1943).

ends his book with the major discoveries of the 19th century. But more important, he is able to say so much in so small a compass because of his skill at architectonic; to examine the rather detailed table of contents is itself to acquire a definite perspective on the material. Some may think that characterizing the Alexandrian period, for example, as that of "The Failure of Nerve" or the Roman period as that of "The Failure of Inspiration" is too rhapsodic for the subjects covered. Yet even though the precise characterization may be debatable, by the adoption of this *kind* of description a positive standpoint is adopted and communicated without waste of words. Something similar, though more restricted, is done by H. T. Pledge, when in *Science Since 1500*⁵¹ he uses chapter headings like "Astronomy Before the Telescope" and "Biology Before the Microscope" in place of simple chronological titles.

Another virtue which Singer possesses abundantly is that of judicious balance in his presentation of philosophers. While he is an authority on Aristotle, he does not hesitate to give Plato his due. He comments, for instance: "The trend of Platonism in general and of ancient Platonism in particular has normally been away from observational activity, even when friendly to mathematics. There are, however, many and vivid exceptions and, moreover, Platonism has often been helpful to science in the presence of an entrenched and static Aristotelianism."⁵² This position is in striking contrast to the all-too frequent one among historians of science, that Plato was an unrestrained calamity for scientific thought.

V

The reason for this common view is the importance of the rise of the experimental method of thinking about and dealing with the world. When there is a tendency to overemphasize this factor in intellectual history, either for polemical reasons or through sheer enthusiasm or perhaps merely unconsciously, other modes

⁵¹ H. T. Pledge, *Science Since 1500* (London, 1939).

⁵² *Short History*, p. 34. Cf. pp. 35-36.

of thought receive less than their due. Sarton, writing under the heading "Scholasticism, Its Cause and Cure," holds that experimentalism is the *only* cure, and in fact possession or lack of this method affords the best means of classifying individuals and groups. "The great intellectual division of mankind is not along geographical or racial lines, but between those who understand and practice the experimental method and those who do not understand it and who do not practice it."⁵³ Dampier's criterion is equally evident when he says: "Indeed, Greek geometry may well be considered to share with modern experimental science the highest place among the triumphs of the human intellect."⁵⁴ But it is geometry which must sue for elevation, not experimentalism. Singer, always more cautious and judicious, regards science more generally as the "active process" of searching for law and order in the universe.⁵⁵ Scientists should, like the Hippocratic physicians, be "patient observers of fact, sceptical of the marvelous and the unverifiable, hesitating to theorize beyond the facts, yet eager to generalize from actual experience."⁵⁶ The chief distinction between Singer and his colleagues is his consistent appreciation of the necessity of a strong theoretical element for the very existence of science. Overemphasis on mere experimentalism can alienate one from science of the most fundamental sort. Sarton refuses to accept Eddington's claims to deduction of the constants of nature because it is *a priori*, despite admittedly "impressive" agreement between his figures and those obtained through experiment.⁵⁷ One wonders how he will judge, in the later volumes of his history, such more flexible forms of *a priorism* as Einstein's. Einstein's reliance on mathematical simplicity as a clue to the structure of nature is in many respects similar to Plato's.

Any history of science can be judged on the basis of its balance between theory and experiment as the warp and woof of science. Of the writers considered above, Singer comes the

⁵³ *Introduction*, Vol. I, p. 29.

⁵⁴ *Op. cit.*, p. 41.

⁵⁵ *Op. cit.*, p. 2.

⁵⁶ *Ibid.*, p. 28.

⁵⁷ *Guide*, p. 38.

closest to this ideal. But this does not deny the merits of the others; each has his peculiar advantages as well as disadvantages. The most we can say is that we as yet have only "incomplete textbooks, there are no others. . . ." ⁸⁸ Whether an adequate general history of science can be the product of one man is not yet clear. The criteria to be met are accuracy, completeness, balance of judgment, and not least, interest. A book need not be as awkwardly written as Wightman's, or have such important critical blind spots as Sarton's. It can only be the novelty of the field of study which allows such efforts to pass uncriticized, and we must agree with Sarton that they are indeed bad friends of the history of science who cherish any work offered them. ⁸⁹

This is the seed-time of the history of science; the ground has been well broken, and the work of the harvest depends on a continuing fertilization, by philosophy in particular. In so doing, the study of the history of philosophy can itself be quickened to new insights and a new growth on the old stems. The responsibility for cooperation rests on all parties; the difficulties and flaws of one-sided efforts should adequately demonstrate the heaviness of the demands and also suggest modes of solution.

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⁸⁸ *Guide*, p. 61.

⁸⁹ *Ibid.*, pp. 44-45.

A CRITIQUE OF SCIENTIFIC CRITIQUES

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THERE are at least two easily recognizable approaches to the philosophy of science. One may feel inspired to reflect on the wonders and defects of the scientific enterprise and the cultural significance of its results. Or one may feel inspired to criticize and to improve the efforts of the scientists or philosophers who talk about science. This last viewpoint characterizes four recent contributions to philosophy of science.¹

Mr. Wisdom, as a philosopher, wants to tell philosophers that they should not use an inductive schema to talk about science. Mr. Bridgman (a scientist) wants to tell scientists they should be more cautious in the use of concepts. Mr. Hempel (a philosopher) wants to tell scientists, and I presume social scientists especially, that defining is a tricky matter and should not be indulged in lightly. And finally, Mr. Brain (a scientist) wants to tell philosophers how to talk a bit more sensibly about brains, sense data and minds. Thus every combination of teacher and pupil in the philosopher-scientist domain seems to have been covered in these four efforts.

Now it is certainly legitimate for a philosopher to ask what right anyone has to tell anyone else how he ought to behave. In a language more suitable to this journal, one may ask for the metaphysical bases of these writers; i.e., from what standpoint are these critiques of others made, and can these standpoints themselves be scrutinized and criticized?

Wisdom's standpoint is this: if you are going to talk about science from the philosophical point of view, then find out what science "actually does." To find out what scientists actually do,

¹ J. O. Wisdom, *Foundations of Inference in Natural Science* (Methuen and Co., 1952); P. W. Bridgman, *The Nature of Some of Our Physical Concepts* (Philosophical Library, 1952); C. G. Hempel, *Fundamentals of Concept Formation in Empirical Science*, International Encyclopedia of Unified Science, vol. II, No. 7 (Univ. of Chicago Press, 1952); W. R. Brain, *Mind, Perception and Science* (C. C. Thomas, 1951).

read their texts (albeit, in some cases, rather old and dusty ones). Wisdom feels that if one starts out from this position, he will find:

1. Scientists begin with hypotheses, not data.
2. Hypotheses are checked by "perceptions," which need not all be reduced to a set of "sense data."
3. There are essentially two kinds of hypotheses, "generalizations" and "non-instantial." The one is testable directly by its instances, the other only indirectly.
4. Science is not based upon a Law of Uniformity in Nature, and hence there is no need for the solution of what is really the insoluble problem of justifying induction.

Wisdom comes to the conclusion that the hypothetico-deductive system presents some possibilities for a rational procedure (i.e., may be justifiable). The bothersome case, he thinks, is the generalization which has had only confirming instances and refers at least in part to the future. If an instance falsified it, the problem is over: the hypothesis is false. He does not tell us how falsifying instances are identified in practice, and indeed seems to see nothing ridiculous in his position despite the fact that "what scientists actually do" more often than not is to ignore the supposedly false instances until they hit the experts over the head with their cumulative force. Wisdom argues that instances that only confirm surely do not make an hypothesis "true." If we try to say that confirming instances increase the degree of confirmation of an hypotheses, aren't we also making an inductive leap into the future and implicitly claiming that we expect the future to be like the past? Wisdom tries to show, at the end of his book, that though there is nothing to force one into a "favorable" thesis about nature, there is also nothing to prevent one from adopting such a thesis. Which way will you wager? If nature is unfavorable, you lose anyway; if nature is favorable, you may win.

Now it seems to me that the important metaphysical assumption of Wisdom's work is his assertion that "metascience" is chiefly concerned with inferences as *actually* practiced by scientists. I keep asking myself if philosophical writers who pose their problems in this manner can really be serious about what

they say. I can see that one would pretty well understand an entomologist if he said: "I plan to study the eating habits of the tarantula; that is, I plan to study what the tarantula actually does when it seeks and consumes food." Does Wisdom mean something like this when he proposes to see what the scientist actually does? For one thing, scientists are unlike most tarantulas in that they cannot be readily identified by a hairy and spidery exterior. It is almost trite to point out examples of scientists who were not recognizable by their colleagues.

I think that in order to maintain his starting point, Wisdom has to adopt the position that despite the variation in methods and areas of study of the scientists, the process of scientific inference had remained and will remain the same. The only changes in science are its discoveries and methods, where "method," according to Wisdom, denotes scientific practices in which the role of inference is not stressed. But surely there have been very significant changes in the process of drawing inferences in science: modern symbolic logic, modern statistical inference, the method of latent attributes, game theory, to mention a few. Such new developments cannot belong to the class of scientific inferences to which Wisdom refers, since, being new, they could scarcely be learned from a study of what science has done. His point must be that all these examples fall under the head of a very general schema of scientific inference. But I am afraid that the generality that guarantees endurance will preclude testing. I presume that Wisdom's contention that science uses the hypothetico-deductive system is itself some sort of an hypothesis. How does he suggest we test it? In his discussion of testability, Wisdom emphasizes that an hypothesis is significant if either it or its contrary has instances (p. 38) and later suggests that theories having no falsifiable instances are tautologies (p. 56). The question to pose is this: can he show that the thesis of the hypothetical-deductive system is neither insignificant nor a tautology?

Bridgman would like to avoid the kind of philosophical pitfalls that beset Wisdom's approach. He wants to talk on a scientific plane to scientists and tell them how they may have strayed from true objectivity. In accomplishing his task, he has much to say that is lucid and enlightening about such matters as

fields, the first and second laws of thermodynamics, and electrical phenomena. For example, he argues that there is no instrumental operation that will enable one to decide between a field description and action-at-a-distance, and the decision therefore (at the present time, at least) can only be based on the convenience of pencil and paper operations.

Despite the down-to-earth quality of Bridgman's writings, he does not avoid metaphysical issues. Even the manner in which a scientist tries to teach other scientists may have some interest to the metaphysician. Bridgman himself occasionally seems to recognize this in his references to the "operational" definition of reality (p. 27), though he may mean these remarks to be quite independent of what philosophers discuss under the name of ontology.

But Bridgman's discussion will be of interest to philosophers even if one feels that operationism's ontology is custom-made for scientists only. For Bridgman argues that an instrument on the spot that accurately and independently records some information about a physical quality is better than an "inference" to a state where no instrumental verification takes place. Or so I construe him. What does "better" mean in this context? Why simply that the inference is less verifiable, less "scientific," and remains in a dubious state until instrumentation takes over. "Paper and pencil" operations are legitimate as simplifications and conveniences in transforming concepts. But instrumental operations are the physicist's contact with reality as he understands it. To me, the philosophical issue rests on the implicit starting point: instrumental operations are not inferential, or are less inferential than other operations of science. This issue seems to be a more critical one for operationalism than the ontological and semantic issues that have so frequently been raised about Bridgman's approach. A good operationalist can merely declare that he represents the viewpoint of reality and meaning that is inherent in science; he can rather cheerfully relegate matters of ontology and semantics to the philosophers.

But the operationalist cannot very well avoid the problem of inference; for if the instrumental readings actually involve as elaborate a network of inferences as the inference to empty space,

say, there would really be no claim for the superiority of the operational method *within* science.

A plausible answer to the question whether "direct" observation is inferential in character may consist in an appeal to each person's own experience when he makes a reading by means of an instrument at a moment of time. But the difficulty of this approach lies in finding an adequate definition of that to which one is appealing. Do we ask the individual to "feel" whether he has made an inference in the process of his "direct" observation? Such supposedly uncontrolled judgments are what Hempel's program at least, is designed to avoid.

One could try a quite different tack and ask what "inference" could possibly mean in the case of a direct observation, since inferences are from something to something else. "Science is in part an inference from direct observation to other types of judgment." This argument, I think, would try to keep science free from the complexities of defining "direct observation," and would try to make the data from which science starts a matter of agreed-upon convention within the body of science itself. The position is perilously close to the notion that science, far from being a free, creative activity, fundamentally follows very rigid standards of conduct. In any case, it is not easy to see how arguments about the legitimacy, say, of dream data could be resolved, except by the declaration of experts. Besides, can one who adopts Hempel's program declare that he is indifferent to the fundamental issues of science? Clearly not, if the program of reconstructionism is anything like what he describes it to be in this book.

Let us see in part how Hempel might approach the problem at hand. He adopts the position that scientific descriptions require a set of terms "signifying certain directly observable characteristics of physical objects, i.e., properties or relations whose presence or absence in a given case can be intersubjectively ascertained, under suitable circumstances, by direct observation" (p. 22). The use of the data of science to serve as evidence is marked by a high degree of determinacy and uniformity.

Evidently the important terms in this account need further explication than Hempel gives them, an effort which would have

carried Hempel well beyond the intended scope of his book.² Suppose we try a slightly more objective translation of his position. Let c stand for an observable characteristic of a physical object, c' for the absence of this characteristic, s for a circumstance in which the object is observed, and p_1 and p_2 stand for two publicly recognizable utterances of an observer. Then a perfect "degree of determinacy and uniformity" would mean, I suppose, something like the following:

A term has maximum determinacy and uniformity relative to a circumstance s , a physical characteristic c , and a class of observers O , if when c occurs in s every member of O always reports p_1 , and when c' occurs in s , every member of O always report p_2 .³

It will not come as any surprise that this formulation is methodologically incomplete. For to ascertain whether a term has a high degree of determinacy, one must test whether p_1 and p_2 occur in the correct fashion with c and c' , and whether s pertains. Evidently, observers are required to conduct these tests. But how are we to keep the test procedure from running into an infinite regress?

One might try to avoid this difficulty by extending the class of terms with which we started, to include terms which signify the presence (p_{11}) or absence (p_{12}) of p_1 in s , or the presence or absence of p_2 in s (say by means of p_{21} and p_{22} respectively). Then we would set up a definition of the determinacy of the set of terms $p_1, p_2, p_{11}, p_{12}, p_{21}, p_{22}$, in the same manner as above. Further,

² "... the conception of an analysis of 'the' meaning of a given expression presupposes that the conditions of its application are (1) well determined for every user of the language and are (2) the same for all users during the period of time under consideration. We shall refer to these two presuppositions as the conditions of *determinacy* and of (personal and interpersonal) *uniformity of usage*." In my subsequent remarks, I presume that determinacy and uniformity are disposition terms in Hempel's sense, i.e., do not simply refer to actual cases of observer's reports. If one did not accept this viewpoint, he would have to say that though observers agreed in all instances, there is no meaning to the assertion that other observers would also have agreed.

³ Actually, the reports of the observers would only occur, say, when a specific request for them was made, but this stipulation can be covered under the term "suitable circumstance," s .

we declare that any other term that purportedly signifies p_{11} , p_{12} , etc., is "meaningless." That is, it is "meaningless" to test whether O_1 's report on what O_2 has reported is itself determinate. I am not sure whether the advocates of direct observation would be inclined to resort to the criteria of the meaningless in so facile a manner. If they did, the anthropologist who wants to observe the consistency of linguistic usage of a group would find himself seriously hampered. In any case, reductionism would certainly run the risk of failing to face issues in order to maintain a pseudo-rigor and precision.

I cannot help but feel that if the problem of determinacy and uniformity of terms, and hence the problem of the language of direct observation, were taken as seriously as, say, the problem of confirmation, one would find it very difficult to maintain that no inference as such takes place when a direct observation is made. I cannot see how a serious reconstructionism can retire to the position that though the problem is theoretically of interest, in scientific practice we "pretty well" know what is and what is not an observation term.

Further, I think a serious look at the matter would reveal a matter of some interest to Hempel's program. For uniformity of usage implies that all observers will agree, past and present. Hence, some Law of Uniformity of Nature (shades of Kant!) is assumed in the meaning of an observation term, namely, a Law of Uniformity of Usage. One fails to see why Hempel should have concentrated his worries so late in the scientific process. Further, there are sure to be problems of the "degree of confirmation" of the hypothesis that such-and-such is an observation term, which should keep those whose interest lie in these matters busy enough. For the degree of confirmation in an hypothesis on the basis of evidence would now have to be measured in terms of the degree of confirmation in the evidence, a result perhaps more congenial to statisticians than philosophers.

Finally, even the most optimistic advocate of direct observation can scarcely think that maximum determinacy and uniformity would occur. In point of fact, except possibly for a few "blue patches" here and there, even reasonably good uniformity of usage rarely occurs in laboratory practice. Often, the issues involved

are not fine enough to demand consistent reports by observers; often, too, the costs of observation are small enough so that an average of many reports seemingly removes the differences between individual reports.

In any case, the matter of uniformity becomes one of "degree." And here a very curious result occurs. For this degree is presumably measured along some continuous scale (if *determinacy* and *uniformity* are disposition terms, this is a probability scale, I suppose, which measures the frequency with which agreement occurs). Now Hempel makes a very convincing case for the position that metrical terms cannot be reduced to a set of observation terms. Thus if an observation term is defined by means of the concept of a high degree of uniformity, and the latter presupposes a metrical term, then an observation term presupposes for its meaning a term that cannot itself be observational.

The point I have been making may seem unduly stressed, but first of all Hempel himself adopts the program of "explication": precisely determined meaning, suitable for rigorous discourse (p. 11). As a consequence, "high degree of uniformity" itself requires such explication. The point is also critical in much of what Hempel says. For example, the following concepts seem to depend on an explication of uniformity:

- a) "reduction of ambiguity" (p. 11),
- b) "science's connection with statements reported in 'experiential terms'" (p. 21),
- c) "operational," which is opposed to "direct observation" on p. 41; apparently "direct observation" is non-operational for Hempel,
- d) "results that do not vary essentially with the tester" (p. 43),
- e) "valuation statements have a smaller uniformity of usage than descriptive ones" (p. 45),
- f) "'intuitive' use of . . . terms in conversational language lacks both determinacy and uniformity" (p. 48),
- g) the entire discussion of fundamental measurements; it is certainly debatable whether the procedures of fundamental mea-

sures "presuppose no other scale of measurement" (p. 69). If observation terms are required by fundamental measurement, then presumably the degree of determinacy is required for all measurements.

These comments are offered in the sense of a request for clarification; it is certainly true that reconstructionists have not ignored the problems discussed here, but I, and perhaps others interested in their work, have not found that the treatment adequately solves the problems involved.

Also, in concentrating on this aspect of Hempel's work I may have given the wrong impression about the value of the whole: this is a wonderfully therapeutic little book for the conceptualizer in science whose philosophical training or common sense may have led him into all kinds of peculiar and useless pathways.

What I have tried to do is persistently raise the question whether the point of departure of Wisdom, Bridgman and Hempel, by means of which they tell others what should be done, is itself subject to test. I think it is. In thinking so, I do not mean to imply that any of the works is therefore ill-advised. But the most interesting activity a philosopher can indulge in is to ask, not so much how a person can get from *A* to *B*, but how he could get to *A* in the first place.

And what of Mr. Brain and his lesson to philosophers? Why he makes my point in his own way. He wants to tell philosophers who talk about perception that their "starting point" should at least be conditioned by what neurology has learned about the perceptive process. Philosophers can become better critics of the starting points of others if they learn what *all* the sciences have been up to in the last few years. Philosophers themselves may still not agree with Mr. Brain's "unified dualism," and indeed my remarks above imply that anyone who, like Brain, accepts Russell's definition of mind ("whatever we know without inference"), might well have to say that the class of minds is empty. But the thesis of more informative conversations between philosophers and the outside world seems to me as important a point as one could make about the whole matter.

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DISCUSSIONS

THE IMMORTALITY OF THE PAST: CRITIQUE OF A PREVALENT MISINTERPRETATION

CHARLES HARTSHORNE

LEO STEIN was rendered unhappy by his inability to comprehend the philosophers—until he reached the consoling conclusion that they were equally unable to comprehend each other! Consoling to him, the conclusion is less so to us philosophers. In the course of a discussion which concerns two philosophers with whom he has been intimately associated, Paul Weiss writes: "To avoid affirming that God keeps past evils in existence, they (Whitehead and Hartshorne) are forced to suppose that God gives being only to that portion of the past that can be made part of a cosmic harmony But then something occurred, to wit past evils, which God does not preserve."¹

Now my contention is this: in whatever sense to "be made part of a cosmic harmony" is the condition for preservation, the *entire* past, and not a mere portion of it, can and does meet the condition and is preserved. And this is the view I have attributed to Whitehead.² (With or without Whitehead I might well have held it, since the original influence came from Royce, as criticized by James, and reformulated by Hocking to meet the Jamesian criticism—not from Whitehead.)

To avoid anti-climax, and as the simpler case, also to warn the reader what my biases are in interpreting a great philosopher who can no longer protect himself, I begin with my own treatment of the topic. (My critic probably followed the reverse order and has construed me through what he takes to be Whitehead's doctrine.) I shall indulge in self-quotation, since on this point

¹ This journal, V (June 1953), p. 519.

² E.g., in my article in Schilpp's *The Philosophy of Alfred North Whitehead*, pp. 542-43.

my opinion has not changed since I began to publish on such subjects.

"The past . . . is contained in the present to the extent that it is retained in memory (absolutely, in God)." ³ "Only in God is the past unqualifiedly in the present." ⁴ (That such complete retention of the past does not contradict its pastness is explicitly maintained.) ⁵ "The world memory is sufficiently conscious fully to realize forevermore all past qualities whatsoever. . . . If there is no such world memory, then all truth about the past is a blind mystery." ⁶ "Unchangeably immortal are all changes, once they have occurred, in the never-darkened expanse of his memory, the treasure house of all fact and attained value." ⁷ Thus the preservation is of all qualities, all fact, and there is no stipulation limiting it to good qualities or facts. Indeed, since retention in God is declared the condition of truth, how could it be supposed true that something is not retained? Frequently the "literal inclusiveness" (or other synonymous expression) of deity is asserted. (This is always, to be sure, with respect to the total concrete actuality, not the mere eternal "essence," of God. The essence, or in Whitehead's language, the Primordial Nature, is held to be abstract and exclusive of the world, and this doctrine contradicts classical pantheism as sharply as the doctrine of total inclusiveness contradicts classical theism.)

What then about evils? They too are said to be in God. "God suffers our evil acts," ⁸ he is "a being to whom suffering is never alien," ⁹ who "sorrows in all our sorrows." ¹⁰ In this sense, he is "the slave, nay the scourged slave, of all." ¹¹ It is

³ This journal, IV (September, 1950), p. 56. See also Vol. I (September, 1947) pp. 47, 49.

⁴ Ibid., IV (September, 1950), p. 59.

⁵ *Man's Vision of God* (hereafter *Vision*) pp. 129 ff.; also Schilpp, loc. cit.

⁶ *Vision*, p. 268.

⁷ Ibid., p. 298.

⁸ Schilpp, p. 553.

⁹ *Vision*, p. 172.

¹⁰ *The Divine Relativity*, p. 54.

¹¹ *Vision*, p. 204.

implied that "tragedy is fundamental in the nature of existence and God." ¹²

How these and numerous other such passages could have been overlooked it may seem not my business to inquire. However, the same question arises in a more subtle form with regard to Whitehead, and I think that an attempt to answer it in the present case will prove illuminating with regard to the other.

1. Mr. Weiss himself once expressed the view that God cannot contain evil or know it "directly," although he knows of its existence in that he knows the good in things to be "not concrete enough to be entirely good." ¹³ The idea that divine awareness, to preserve its perfection, in a manner skips over the evils of the world (an idea which had been set forth earlier in the writings of May Sinclair) has considerable resemblance to the view which Weiss attributes to Whitehead, and some of this writer's expressions can rather easily be taken to embody it. Thus Weiss was doubly disposed to find it in my writings.

2. There may have been a tendency to confuse "God *contains* evils" with "God *is* evil." Now a house can contain small bricks and yet not be small. And of course no one is maintaining that God *is* evil, in any normal sense of this expression. Let us consider cognitive evil (error, ignorance) and ethical evil (decisions deliberately disregarding of legitimate interests). A conscious subject may contain false belief by believing falsely, or a callous decision by deciding callously. But there is another way. He may contain the belief or decision not by thus believing or deciding, but as the believing or deciding of a being which he contains or possesses as immediate datum of intuition. The decision, the affirmation, is the included being's not the including being's. The included being is embraced as self-deciding. As Fechner long ago pointed out, there is an analogy in psychophysics for such a relationship, in the way impulses and voluntary control are together in one mind. ¹⁴ Our volitions may have the

¹² *The Divine Relativity*, p. 149.

¹³ Paul Weiss, "God and the World," in *Science, Philosophy and Religion* (First Conference, 1941), pp. 420 f., 423 f.

¹⁴ *Vision*, pp. 291 ff.; Schilpp, pp. 527 f.

function of impulses for God, and it is an old doctrine that ethical evil lies not in impulses as such but in bad control of them. Yet, however controlled, they cannot be deprived of all their spontaneity, their self-determination, and still function as impulses. And without impulses, something involuntary, there is nothing for volition to do. According to this theory, the most wicked act is literally in God, and while wicked as our volition, as divine impulse it is not subject to ethical description, positive or negative. (To many, such terms as "impulse" will appear crude or degrading in application to God, but the point is that *any* psychological term, such as "will" or "knowledge," is equally so, unless taken analogically rather than literally.)

In regard to evil in the form of suffering, the distinction between voluntary or involuntary, or (in the case of belief) affirmation or non-affirmation, cannot be used to limit the evil to the included being. If pain is in one's consciousness, then one suffers. Suffering is passive, and its evil is not evaded by the mere fact that it is felt passively as belonging to another. Decisions and beliefs cannot be imposed, but all who suffer impose suffering upon those who love them, including God. Thus God escapes no suffering whatever. Of course, when he suffers our despair, he does not despair; for this would involve a belief-element, and aspects of error and ignorance. But the mere suffering he fully feels. He also feels inconceivably many other feelings; but this subtracts no positive character, it only adds others. (Suffering is positive, since it is not the mere absence of pleasure.) That the suffering of God detracts from his "perfection," in any sense in which this term can legitimately be used to define the essence of deity, is one of the contentions I have tried to disprove.¹⁵

Permit me one more self-quotation.

Nor is it true that we reach the divine ideal by abstracting from evil. God is not the being whose life is sheer joy and beauty, but the cosmic sufferer, who endures infinitely more evil than we can imagine. What we abstract from in conceiving God is that which is itself a kind of abstraction, namely ignorance, lack of interest in the interests of others. God is the concrete unity of the world, not the

¹⁵ Op. cit., Ch. I and pp. 157-63, 294 f.; Schilpp, pp. 529 f.; *The Divine Relativity*, pp. 25, 41-49, 86-88, 116-58.

selected catalogue of its good aspects. This unity as such is good ethically, in that it is strictly all-inclusive and does face fully the evil as well as the good, does not evade anything or fail to realize the full quality of things. One may abstract the mere property of inclusiveness or catholicity of interest, the lovingness of God, but in so selecting this wholly good aspect (the primordial nature) we are omitting not only all particular evils but also all particular goods, the whole consequent nature of God, and have merely the fact that God always loves everything, without any of the things he loves This generic goodness is purely good only from an ethical standpoint, for from the aesthetic it is both good and evil, since the general form of love has the two sides of rejoicing with the joy and sorrowing with the sorrows of others, or of promoting their welfare, and in a manner loving what they love and hating what they hate.¹⁸

Obviously there is too little said here about the standard or ideal by which God defines "their welfare," but that is irrelevant to the present topic. Mr. Weiss may be able to refute the doctrine expounded in the foregoing quotations. But it is not the one he did refute.

3. A third source of misunderstanding may be this. I have frequently referred to the values of the world, or the joys and satisfactions, as being embraced in God, without simultaneous mention, in some cases, of the disvalues, the sorrows and dissatisfactions. This is because of the belief that every concrete experience as a whole is a value rather than a disvalue. When life offers us less than nothing, we do not live. At the least, we lose consciousness for the time being. The mere flight from evil cannot, even momentarily, be *the* motive for the will to live, for as just indicated there is another and more effective way to escape evil. We wring some kind of satisfaction, however poor or strained, out of pain and frustration; though we may feel very keenly how much better life might be. Thus the fact that God inherits all our feelings does not mean that he is in danger of finding disvalue overbalancing value. Even for us this does not occur. And since all concrete experiences involve some sort of connection with evil or suffering, even if only in dim remembrance or vague anticipation, a being who felt only the good in the world would not feel the actual concrete good, but only some abstract diagrams

¹⁸ *Vision*, pp. 331 f.

of good (if even that). The determinate individuality of events, in which their richness of contrast and beauty lies, would be lost. And in God there is not the weakness of aesthetic power which forces us to lapse into unconsciousness when we are unable to synthesize the data offered to us, and which forces us always to drop out much of the detail. Surely it is this method of harmonization through inattention, or virtual blindness, which distinguishes us from deity.

My critic feels that the union of past and present should not depend upon God, but should be grounded in our own creaturely existence. As the quotations have indicated, my view is not that there is a present in the world simply excluding the past, or that there is a present in God including it; rather, there is inclusion in both cases, "deficient" or "imperfect" in the world, "unqualified," "absolute," "perfect," "non-deficient" in God. The reason for denying unqualified inclusion to the worldly entities is experience. The past is deficiently continued in the human present in memory. Yet the very notion of truth seems to involve some continued reality for the events, in all their details, about which there is truth. Consulting experience for some way to reconcile the deficient immanence of the past as realized in memory with the idea of truth as absolute we see that it could be done by conceiving a memory which is the other term to the contrast implied in calling our memory "partial" or "inadequate," namely an impartial and adequate memory. I, at any rate, see no other way in which experience gives us the means to make the reconciliation. Deficient memory is fact, and yet, except for the deficiency, memory is the inclusion of the past in the present which truth requires (for it is *now* that we make use of the truth as measure of our knowledge when we say that we know but little of the truth about the past). Remove the deficiency and the problem is solved. Put aside memory and talk about bare abstractions like "existence," and you merely have the problem over again. (Whitehead's "fallacy of misplaced concreteness" applies here.) In realizing the imperfections of my retention (in memory plus reconstruction) I am sensing the contrast between it, as largely unconscious, dim, faint (or else, if inference is resorted to, uncertain, inaccurate) and a conscious, clear, vivid and certain reten-

tion in which the whole quality of the past, all its joy and sorrow and contrast and harmony and discord, is still possessed.

How far is the foregoing doctrine identical with Whitehead's? It is easy to quote passages that seem plainly to confirm this identity. Unfortunately they are not the only passages relevant to the topic. There is some appearance of inconsistency or wavering in Whitehead's exposition. Several distinct interpretations have been given, including Mr. Weiss's. So we must proceed warily. Let us consider first a passage obviously favorable to the view I should like to find Whitehead holding: "The truth itself is nothing else than how the composite natures of the organic actualities of the world obtain adequate representation in the divine nature . . . the 'consequent nature' of God . . . In this way the 'ontological principle' is maintained, since there can be no determinate truth, correlating impartially the partial experiences of many actual entities, apart from one actual entity to which it can be referred."¹⁷ Now here we have the explicit statement that a function of God is to constitute the definitive and complete truth about events by adequately and impartially prehending them. The ordinary actual entities cannot do this because of their inadequacy or partiality. Surely this implies that *no such partiality characterizes God*. Now the interpretations with which I disagree seem to me to dilute, or render equivocal, the "impartiality" of God, so as to destroy the very meaning of the idea. It is not enough that God impartially collect the good aspects of entities, omitting the evil. For then how would it be "determinate truth" that these evils had really occurred? Moreover, Whitehead repeatedly says that God participates in the sufferings of the world as well as in its joys. He rejects as a "profanation" the ascription of "mere happiness" to God,¹⁸ speaks of him as "the fellow-sufferer who understands,"¹⁹ and lists as characteristics of the divine self-fulfillment, "Tragedy, Sympathy, and the Happiness evoked by actualized Heroism."²⁰ Such, he adds, are "the

¹⁷ *Process and Reality*, hereafter *Process*, p. 18; see also p. 352.

¹⁸ Schilpp, p. 697.

¹⁹ *Process*, p. 532.

²⁰ Schilpp, p. 698.

human terms in which we can glimpse . . . the immortality of the World of Action, derived from its transformation in God's nature." So far everything clearly points to the view I am defending, except perhaps the word "transformation." Other terms used in this connection are "transmutation" and "reformation." We are also told several times that God loses "nothing that can be saved."²¹ This appears to imply that something is left out or lost. I think this is a misinterpretation, though a natural one.

Consider the following:

The kingdom of heaven is not the isolation of good from evil. It is the overcoming of evil by good. This transmutation of evil into good enters into the actual world by reason of the inclusion of the nature of God, which includes the ideal vision of each actual evil so met with a novel consequent as to issue in the restoration of goodness.

God has in his nature the knowledge of evil, of pain, and of degradation, but it is there as overcome with what is good. Every fact is what it is, a fact of pleasure, of joy, of pain, or of suffering. In its union with God that fact is not a total loss, but on its finer side is an element to be woven immortally into the rhythm of mortal things. Its very evil becomes a stepping-stone in the all-embracing ideals of God.²²

Please observe: the ideal vision is not of the "novel consequent" *instead* of the "actual evil," but of both in a certain relationship. This I submit, flatly contradicts the idea that the evil is in any sense omitted from divine realization. One cannot envisage X as "met with" Y, and not envisage X. Every evil or suffering is there in God's nature as just "what it is"; but *also* there, in the "union" of the fact with God, is a "finer side." What is this finer side? Here the critics seem to have confined their attention to words with not much attempt to think any thoughts corresponding to them. Yet Whitehead has not left us without help here. God does not merely feel our feelings, turn us as initial data into objective data. He also has "subjective forms" of feeling, feelings *about* our feelings as felt by him, of how they contrast with other feelings in the world, of how the next step in the world's becom-

²¹ *Process*, p. 525.

²² *Religion in the Making*, p. 155.

ing might best minimize the bad effects of the evil occurrence and elicit such good effects as are possible.

Now I shall perhaps be told that it is *only* on its finer side that the evil occurrence is said to be woven immortally into the rhythm of things. Let us see if this makes sense. The finer side is a feeling-about-our-feelings. It is the inclusive aspect, the finer side of just the evil which is being prehended as prehended. Hence this evil itself is woven immortally into future process; but not the evil alone, rather the evil with or in its ideal complement of vision. There is sheer addition, not subtraction or omission.

Why then does our great metaphysician speak of "loss"? And if the evil is still there, how is it "overcome" with good? And why say it is "transformed" if it is still just "what it is," that is, what it was? Now, on my interpretation, all of these expressions have an intelligible function. The suggestion that something is lost by the occurrence of evil warns us that, while the divine synthesis creates as much good as the state of the world makes possible, still this does not mean that no harm is done by evils, that it is indifferent whether we fail or succeed, and whether we do our best or not, since God will equally achieve beauty in either case. Whitehead is not an optimist in this sense, and explains his refusal to identify God with creativity partly on this ground.²² God makes the best of evil, but he can do better still with good. Was it not natural (though it has proved unwise!) to express this by saying that something is "lost" for the universe or for God when evil occurs? We are, in fact, told that the language about loss and saving is at best metaphorical, "but an image." Obviously metaphorical also is "overcome with good"—meaning, I suggest, that deity realizes the most good which can be achieved through synthesis into new subjective forms, which include the evil to be sure, but much more besides. Finally, that the occasions are "transformed" is no technical doctrine, for if it were it would have to be a category, and there is no category of transformation in this system. ("Transmutation" as category I shall consider presently.) Occasions become but do not change, and there is no change save the successive becoming of occasions

²² *Science and the Modern World*, pp. 150-51.

in various sequences or societies. Yet somewhat as we can, assuming this philosophy, still speak loosely of bricks being transformed into a house, so we can say that partly evil occurrences are changed from isolated entities by being taken into a new whole of ideal sympathy and vision beholding *also* what the future can best do with the good and the evil in them. In objectification, "initial data" become "objective data," and these just *are* the initial data fully prehended, save so far as something is not effectively or adequately prehended—or, to put it bluntly, save so far as there is ignorance. Thus the category of "transmutation," as used where God is not in question, applies when a highly complex nexus, as the initial datum, is simplified, through elimination of all but some one character pervasive of the nexus, and projected into a mere sense datum, such as a patch of red out there, as the objective datum. But this just means that organisms to which this applies are abysmally, and more or less invincibly, ignorant as to the details of their environment. And nothing in the initial datum is altered, but rather there is in addition something new, a vastly over-simple image in a new actual entity which is unable even to imagine the complexity of the initial datum. Is this then the sense in which, as alleged, there is loss of evil in God? Does Whitehead really hold that God is ignorant of some of the things the critics of Whitehead's God know quite well, namely the blend of good and evil in certain occasions! Whitehead seldom uses the term "omniscience," but he says that the divine knowledge is "adequate," "impartial," and coincident with the truth. This is all of omniscience but the bare word.

It is sometimes argued that since Whitehead normally explains his category of physical prehension or objectification to involve "abstraction," "limitation," "negative prehension" excluding some aspects of the initial data from the objective datum, it would be inconsistent for him, holding as he does that God too must "exemplify" the categories, to introduce a new principle, that of unlimited objectification, to describe God. This is a natural, but I think a thorough misunderstanding. First, it is not a new principle, but the same principle, emphasizing, however, the other side of the duality: partial objectification contrasted with "impartial" or "adequate." The one has meaning only by reference to

the possibility of the other. This is all the clearer in that the partiality could be defined only by reference either to the whole truth or reality, or to impartial objectification, and the ontological principle expressly excludes the former as anything distinct from the latter! But, second, God is the "*chief* exemplification" [italics mine] of the categories, and this means, the supreme and qualitatively unique exemplification. Otherwise, why introduce God at all! If ordinary "prehensions" suffice, then the extraordinary kind which alone are divine are superfluous. If "partial" perspectives suffice for truth, then let us hear no more of an "impartial" perspective or of God. Partiality is indeed inherent in "prehension" in the *ordinary* or non-divine sense. Just so is "abstractness" of prehension; and indeed the partiality simply is the abstractness, with emphasis upon its systematic character.

The question may be asked (and I admit the answer is not easy), how is it *possible* for God to unite all initial data into one complex objective datum? Are not some of the initial data incompatible aesthetically with one another? God then may unite whatever can be united, but not even he can do more than this. Now there are indeed incompatibilities that God could not surmount.²⁴ He could not enjoy a world in which a certain man decides to be a scientist (with his main energies) and yet this same man (in the same or another world) also decides to be an artist with his main energies. God thus cannot "have everything." But this is the same as saying that certain combinations of occurrences cannot be actualized because they contradict one another. Combinations which do occur cannot be contradictory in this sense, and hence cannot be incapable of divine realization, at least not for the same reason. And Whitehead has explained how what is aesthetically incompatible on a simple level of prehension, can be made compatible by suitable supplementation of imaginative or conceptual material. Thus he speaks of "the easy road of Anaesthesia by which discordant factors are dismissed into irrelevance; the activity of the mental poles in building conceptual experience into patterns of feeling which rescue discords from loss."²⁵ Can

²⁴ *Adventures of Ideas*, p. 357.

²⁵ *Ibid.*, p. 379. Note that on p. 225 of *Process*, the impossibility

it really be correct to attribute the "easy road" to God, or to suppose that he is limited in conceptual power, and hence cannot always rescue discords from loss? And if Whitehead intends this, why does he say: "In the temporal world . . . process entails loss: the past is present under an abstraction. But there is no reason, of any ultimate metaphysical generality why this should be the whole story." ²⁶ There is but one logically possible way in which it could be other than the whole story, namely, that at least one prehension, or set of prehensions, should be wholly concrete or without eliminations of any kind. When, then, in the next chapter, we are told that in the Consequent Nature "the many are one everlastingly, without the qualification of any loss either of individual identity or of completeness of unity," ²⁷ what can we conclude but that here "loss" is meant literally, and that its denial means the full concreteness of the objectifications? Johnson rather arbitrarily denies this, softening his misdeed by the word "apparently." ²⁸

It is sometimes said that if any occasion were remembered without any loss of its immediacy or vividness, then it would be occurring over again in the present, it would not really be past or "perished." But to become past or to perish is not to alter ("actual entities do not change"); it only means a new entity becomes which feels the previous entity. For a unit of becoming to be thus felt by a new unit, there is no need for the previous becoming to become over again. Its "decision" has once for all been made, and it is available *in its entirety* as material for a new decision about a new experiential synthesis. The "evaporation of indecision" of which Whitehead somewhere speaks only means that the chance has gone by to decide *otherwise* about *that* unit of becoming, what it is to be. Henceforth it can only be accepted, whether in its fullness, or under an abstraction. Either way, the

of items coexisting in one actual entity is qualified by "in certain gradations of relevance." In God, on my view, the relevance would be complete and not a matter of gradation; hence the qualification would not be fulfilled.

²⁶ *Process*, p. 517.

²⁷ *Ibid.*, p. 532.

²⁸ A. H. Johnson, *Whitehead's Theory of Reality*, p. 65.

decision is irrevocable. And yet, if abstraction were the last word, how would the decision be irrevocable? For, since all subsequent occasions would exhibit the decision incompletely, it would, in effect, be remodelled in innumerable ways. Note also that Whitehead does not simply say that occasions perish. He says they "perish and yet live forevermore." Indeed, unless they live forevermore, they will not have perished, for there will be no answer to the question, just *what* was it that perished? It was not something abstract, dead, or half dead, but a concrete living experient occasion. I have argued many times that the most complete preservation of past experience does not contradict its pastness. For while the earlier is objectified in the later, the converse does not hold, and thus the temporal distinction and direction is not abolished. To apply this ordinary limitation to God is devoid of logic, so far as I can see. He is not intended to be ordinary.

But I wish to offer one more passage which seems to me almost enough of itself to settle the question. The temporal world is said to be "perfected by its reception and its reformation [in God]. . . . In this way God is completed by the individual, fluent satisfactions of finite fact, and the temporal occasions are completed by their everlasting union with their transformed selves, purged into conformation with the eternal order which is the final absolute 'wisdom.' " " Please note that what is *purged* is not temporal occasions (for then they would *be* their transformed selves and there would be no union of two factors); and note also that what is *everlasting* is not just the "transformed selves" of occasions but their *union* with these. How could Whitehead have said more plainly that he did not mean evils were omitted, but only that God *adds* to all such evils a context which produces in relation to them, whatever good can be made to result? Again we read, "God's subjective aim prehends every actuality for what it can be in such a perfected system (the Consequent Nature)—its sufferings, its sorrows, its failures. . . woven by rightness of feeling into the harmony of the universal feeling, which is always immediate, always many, always one, always with novel advance . . . and never perishing. The revolts of destructive

²⁹ *Process*, p. 527.

evil, purely self-regarding, are dismissed into their triviality of merely individual facts; and yet the good they did achieve in individual joy, in individual sorrow, in the introduction of needed contrast, is yet saved by its relation to the completed whole."³⁰ I must beg the reader to look sharply at this passage. The "harmony" effected is not in the data as prehended (as objective data) but in the rightness of feeling with which God shapes his own ("universal") *subjective* forms, *his feelings about* our feelings, not our feelings simply as participated in by him, as "objective forms" of feeling. And surely this "relation" between the worldly occasions as they are, and their transformed selves, is not a reality suspended (contrary to the ontological principle) in a vacuum between the worldly occasions and God. Surely the union, with both its terms, is everlastingly possessed by deity. We are virtually told just that.

In sum, while the interpretation I oppose is understandable in view of some of Whitehead's expressions, I cannot think there is any good case for it, taking the system as a whole, or for supposing it was what he really thought, unless perhaps in moments of semi-absent-mindedness. Nothing he wrote becomes nonsense on my interpretation,³¹ but many passages do become so, as I have shown, if it is rejected.

Mr. Weiss charges that the past as retained in God has lost relevance to the present as in the world. This is to forget or dogmatically to dismiss the doctrine known as the "superjective nature of God," God's Consequent Nature as a potential for the general creativity (application of the Principle of Relativity). God's vision of the past, each event in its everlasting union with its ideal complement, is in turn datum for the creaturely prehensions, and is thus "included in the world." This is the "particular providence for the particular occasion," the flooding back into the world of the love in heaven.³² The idea is put in many ways. (See some of the previous quotations.)

As far as I am personally concerned, I confess I had rather be

³⁰ *Process*, p. 525.

³¹ If there is any exception it is pp. 345-47 of *Process*. These paragraphs are difficult—on any interpretation.

³² *Process*, p. 532.

misrepresented than ignored, especially in view of this opportunity to produce a somewhat "novel consequent" complementing, though not divinely, the perhaps not wholly good elements making up Mr. Weiss's criticisms.

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STALLKNECHT'S CRITERION OF EXISTENCE

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IN his article, "Decision and Existence,"¹ Newton P. Stallknecht suggests that the insight of the existentialist should be brought to bear on the traditional problem of characterizing existence. In particular, he is concerned to show how the philosophy of Leibniz involves a mode of thinking which has "failed to apprehend the true quality of existence."² Because the "extreme 'essentialism' of Leibniz's theology stands . . . in contrast with his keen sense of the individual and the spontaneous,"³ this philosophy, the author contends, should appeal to, and fascinate, the student of existentialism. Let us note that two questions are involved in the issue as presented by Mr. Stallknecht:

1. how it is that we can say of anything that it exists; and
2. how we can attribute individuality to anything. The first question, e.g., is concerned with distinguishing the actual or existing *John Doe* from all other *merely possible John Does*. The second, e.g., is concerned with determining how John Doe exists *as an individual*, in the sense of his spontaneity, or of his subjectivity. Historically, these problems have been kept separate in

¹ This journal, VI (Sept., 1952), pp. 31-44.

² *Ibid.*, p. 31.

³ *Ibid.*

inquiry, though they are by no means unrelated. Mr. Stallknecht does not always keep them separate in his paper, even to the point of shifting from the one to the other, finally answering the first question (or problem) in terms of an answer to the second: "To *exist* is to have an unfinished history and a problematic future, the two being united in decision."⁴

I shall confine my remarks primarily to Mr. Stallknecht's proposal of a criterion of existence; a criticism of his discussion of Leibniz's views being subsidiary, of course, to the purpose of this paper. It does not seem to me, that in the passage just quoted, or elsewhere, has Mr. Stallknecht provided a criterion of existence at all. Throughout his discussion, he deems it vital that "existence" be characterized by the ability to rehearse alternatives. But could not this kind of activity go on in a "possible" world? How would Mr. Stallknecht go about attributing "existence" to a human being in a decision-making situation, on the basis of the fact of that situation? How would one *know* the difference between having a *merely possible* status and an existent, or actual status, except by reference to an actuality otherwise defined? The property of decision-making also would have to be attributed to each of the "possible Adams" he discusses (p. 34), each having, *qua* possible, a "complete biography." It does not seem helpful, moreover, to say that in an existent world one makes a *real* decision. This involves the additional problem of determining just what a real decision is. A partial answer is provided by what the existentialist means by a "feeling of freedom" in making decisions.

Mr. Stallknecht is insistent in maintaining that "our existential freedom (which is really a 'feeling of freedom') is incompatible with a fully determinate future."⁵ He appears to confuse "determinate" with "determined" (in some fatalistic sense). I suggest that we may well have a feeling of freedom and yet have a determinate future. Let us imagine that, as human beings, we see a fire-cracker explode. To a tiny insect, whose specious present is shorter than ours, this appears as a series of events, the

⁴ Ibid., p. 40. Italics his. It seems to me that from pages 31-37, he is discussing the first question; from pages 37-44, the second one.

⁵ Ibid., p. 42.

outcome of which is in its distant future. We, of course, would know what was going to happen to the insect. But it, presuming that everything was safe would simply go about its chores, making significant choices, for many "insect-years." Its future would be determinate, but not determined, because its choices would be operative as a cause of its actions *and* it would have a feeling of freedom as well. The analogy is clear. Our futures are as items in God's specious present. Even though God "knows the outcome," we are still free. Our freedom is a fact, because our choices are causally efficacious in our actions, *and* we likewise, have a feeling of freedom.

Mr. Stallknecht's "material" difficulties in proposing his thesis grow out of a more "formal" error. What he has done is to answer a question involving "existence" in terms of another one involving individuality. He maintains that "... our sense of existence as distinct from essence or possibility is included in *our self-consciousness as agents of decision*."⁶ Moreover, he has chosen quasi-evaluative language in which to describe individuality, and hence existence. He speaks of "conscious choice" as the "fullness of existence."⁷ This represents a confusion of metaphysical and value terms, or categories. We may well say of an existent person, once his existence has been established, that he has, or lacks self-determination, or spontaneity; but these attributes are no key to the affirmation of his existence. Many terms may qualify existence, such as "wretched," "full," etc., but they are not criteria (in the metaphysical sense) of it.⁸ It seems to me that Santayana's explanation of "to exist" as "to be in space, time, and in dynamic connections,"⁹ for example, shows the kind of contribution to the advancement of metaphysical inquiry which we want.

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⁶ Ibid., p. 41. Italics ours.

⁷ Ibid., p. 41.

⁸ One may even speak of "authentic existence," but this is an evaluative phrase. Cf. Marjorie Grene, "Authenticity: An Existential Virtue," *Ethics*, LII (1952), pp. 266-74.

⁹ Paraphrased loosely from George Santayana, *Skepticism and Animal Faith* (New York, 1924), p. 42.

RELATIVITY, CAUSALITY
AND WEISS'S THEORY OF RELATIONS*

ADOLF GRÜNBAUM

MR. WEISS's recent article "The Contemporary World"¹ is an attempt to outline nothing short of a general theory of the logic and ontology of relations. The theory of relativity avowedly has a far more narrow scope. The issue raised by Mr. Weiss's critique of the theory of relativity is therefore *not* whether that theory is an adequate general metaphysics of relations. What *is* at issue, however, is the philosophical adequacy of the relativistic assertions concerning the distinctly temporal and causal relations between physical events (things).

I shall maintain that Mr. Weiss's objections to the theory of relativity are invalid, and then make a few remarks concerning his treatment of the problems of potentiality and individuality.

It is misleading to say that the theory of relativity asserts that "*all* relations are products of actions over a course of time" (p. 535, my italics). The relevant claims made by that theory are the following:

1. A very large amount of experimental work on electrons showed that the mass and kinetic energy of a material particle become infinite as the velocity of the particle approaches that of light.² Hence the velocity of light is an upper bound for the motion of all material particles.

2. All waves in nature capable of transmitting an effect or signal travel either at the velocity of light or at lower velocities.

* This discussion is a slightly enlarged version of a paper read before the fourth annual meeting of the Metaphysical Society of America, held in New York City on March 21, 1953.

¹ Paul Weiss, "The Contemporary World," this journal, vol. VI (June, 1953), pp. 525-38.

² C. Möller, *The Theory of Relativity* (Oxford, 1952), pp. 88-89 and 76, and Gerlach, *Handbuch der Physik*, XXII (Berlin, 1926):

In particular, all electromagnetic waves travel at the velocity of light, and these waves are nature's most fundamental and pervasive form of transmitting an effect.

3. The temporal ordering of spatially separated events as earlier and later in public time depends crucially upon the use of signals which can connect these events. Since light is the fastest signal in nature, nature does not make available to us arbitrarily fast signals for establishing a cosmic matrix of temporal relatedness in which each occurrence has an *unambiguous* place. Instead, the intrinsic limitations imposed on the construction of such a temporal order by the velocity of light make themselves felt in the following way: for any given event *E* and any given point *P* elsewhere in space, there is *at P* not just *one* but a whole *class* of successive events each one of which is neither earlier nor later than *E*. It is this physical fact which enables us to *define* any *one* of this class of events *at P* as "simultaneous" with the distant event *E*. Hence the character of the temporal relatedness of spatially separated events depends fundamentally on the limitations governing the transfer of signals.

4. It is clearly meaningless to say that one object is larger than another unless there is a common standard for making the comparison. Hence statements regarding the relative size of spatially separated bodies derive their significance from the existence of a common metrical framework to which each of these bodies can be referred individually. But, as innumerable studies on the foundations of geometry have shown, the very construction of such a metrical framework requires at the outset the use of a standard body, the standard of congruence, by whose *transport* and application a common measure can alone be defined. Thus *both the standard body and such other bodies as affect its behavior during transport* are *intrinsic* terms of the metrical relatedness of the two spatially separated bodies under comparison. It follows that the metrical relationship between two distant bodies *requires the mediation of a causal process for its very meaning*; so long as the bodies under comparison remain spatially separated, their size relationship is unavoidably a *many-termed* relation and *not*, as Mr. Weiss would have it, a merely *two-termed* relation.

To deny this is to affirm all that has been rendered untenable by 19th century developments in geometry and by the physics of the process of measurement.

5. It follows from the preceding statements that when two spatially separated occurrences stand in the relation of cause and effect, then the cause is always earlier than the effect. This is an explicit denial of the claim that the causal relation can be sustained only by simultaneous events. Thus, the theory of relativity denies Aristotle's and Aquinas' claim that with the cessation of the cause, the effect ceases also.³ And for the same empirical reason, Einstein's theory denies the physical possibility of Newtonian instantaneous action-at-a-distance.

Mr. Weiss's objections to these several relativistic affirmations take the form of *reductio ad absurdum*, counterexample, and outright denial. He objects that Newton's third law of action and reaction could no longer hold for bodies separated by a distance, if effects are not transmitted instantaneously. I don't see that there is any reason to think that Newton's third law *must* hold for bodies separated by a distance and therefore do not consider that Mr. Weiss has succeeded in offering a *reductio ad absurdum* argument against the relativistic principle of noninstantaneous transmission of an effect. In the relativistic mechanics of two particles and the forces exerted by them, Newton's third law is preserved only for *contact* forces, as in the case of collision processes, and not for particles separated by a distance.⁴ Thus, Mr. Weiss is mistaken in asserting that "a physics presupposes" that things make "a difference to one another, *then and there*" (p. 525, my italics). And Einstein's abandonment of Newton's third law for

³ *Summa Theologiae*, I, 96, 3, ob. 3: "Causa cessante cessat effectus." Cf. also Aristotle, *Posterior Analytics* 95b, and I. Kant, *Kritik der reinen Vernunft* (1787), B.248-49. For an acute rebuttal of Kant's analysis of the causal relation between the lead ball and the depression in the cushion, see Paul Weiss, *Nature and Man* (New York, 1947), p. 4. See also J. S. Wilkie, "The Problem of the Temporal Relation of Cause and Effect," *British Journal for the Phil. of Science*, I (1950), pp. 221 ff.

⁴ Cf. P. G. Bergmann, *An Introduction to the Theory of Relativity* (New York, 1946), pp. 85-86; R. C. Tolman, *Relativity, Thermodynamics and Cosmology* (Oxford, 1946), pp. 46, 42; and Møller, op. cit., p. 70.

the case of bodies separated by a distance does not entitle Mr. Weiss to claim that "each thing would . . . form a universe all to itself, . . . , having nothing to do with whatever else there be" (p. 525). In Einstein's world, things still "belong to the same world" and "have something in common" (p. 526) even though it takes time to establish relations of influence between them. Do sodium atoms separated by billions of light years cease to share the characteristics of sodium merely because there is no instantaneous transmission of an influence between them?³ Despite the denial of Newtonian action-at-a-distance in the theory of relativity, the features of any particular part of Einstein's world are as much affected by the character of the whole as in the Newtonian world of action-at-a-distance. For the space-time geometry of any local segment of the Einstein world depends on the mass and energy distribution *throughout* the world.⁴ And even though gravitational effects are propagated through space only with the velocity of light, it is still the case that every change in the distribution of matter is held to produce a gravitational effect on other masses in the universe.⁵ In fact, there is even *more unity* in Einstein's world than in Newton's in the following sense: Einstein follows Mach in interpreting the centrifugal forces on a rotating body as due to the *one-many* relation of that body to all the other masses in the world, while Newton had attributed them instead to the *one-one* relation between the *solitary* rotating body and absolute space. I therefore cannot see that Mr. Weiss is justified in maintaining that there is "nothing in current [physical] theory . . . which . . . allows for the fact that things have common characters. . . ." (p. 526).

He also seems to maintain that if there is to be a time-gap between a cause and its effect elsewhere in space, as demanded by relativity, then the cause cannot produce the effect. For he asks "how" the cause can "act on" the effect, if the cause is past by the time the effect occurs. But if his reasoning here is to be a criticism of Einstein's causal doctrine, then he is forced to *deny* the theory

³ Cf. R. C. Tolman, *Relativity, Thermodynamics and Cosmology* (Oxford, 1934), § 75, pp. 184-185 and § 78, pp. 189-190; also A. Einstein, *Ann. d. Physik* LV (1918), p. 24¹.

⁴ Cf. H. Weyl, *Space, Time, Matter* (New York, 1950), p. 251.

of non-instantaneous causation and affirm with Aquinas that causation obtains only between *simultaneous* events. For if his criticism of Einstein's causal doctrine were valid, not only would Einstein's causal doctrine be rendered untenable but also any doctrine of causation which affirms a time-gap between cause and effect. Thus Mr. Weiss has no choice but to affirm the simultaneity of cause and effect, *if* he is to uphold his objection to Einstein's doctrine. Yet in other parts of his article and elsewhere (cf. footnote 3 above), he explicitly denies that cause and effect are simultaneous. And if this denial is to be upheld by him, then the very reasons which entitle *him* to affirm a time-gap between cause and effect will, of course, also serve to uphold the *relativistic* doctrine against his own criticism of it! Whatever Mr. Weiss's constructive alternative to Einstein, we should note that his objection to Einstein's causal principle can be grounded only on the outright assumption that causal *action* is a relation between *simultaneous* events. But since neither this assumption nor Einstein's rival assumption are true or false *a priori*, it is a decidedly *empirical* question which one of them is true. And the empirical evidence overwhelmingly favors Einstein's doctrine.

Quite independently of the merits of Mr. Weiss's conception of the temporal relation between cause and effect, it is of basic importance to note that the questions we ask about the temporality of causation or anything else are always posed in the context of assumptions as to what situations or states of affairs in the world are the *de facto* "natural" ones which can be taken for granted:⁷ those who ask "how" *non-simultaneous* events can be causal related do not ask the same question concerning simultaneous events! For they simply assume, albeit erroneously, that there *are* and hence can be *simultaneous*, spatially separated events which *are* causally related as a matter of brute fact in the "natural" course of things. It then follows inescapably, of course, that causal interaction between *non-simultaneous* events is either impossible or calls for a special explanation, while the allegedly "natural" type of instantaneous causal interaction does not! The shoe, however,

⁷ Cf. A. Grünbaum, "Some Highlights of Modern Cosmology and Cosmogony," this journal, V (March, 1952), pp. 497-98.

is on the other foot: causal interaction between non-simultaneous events is the "natural," *de facto* state of affairs, and hence the state of affairs envisioned by Aquinas and Newton is physically impossible. Newton did not possess the empirical evidence for recognizing the existence of a limiting velocity in nature and hence had no reason for denying the possibility of instantaneous action-at-a-distance.

It is misleading to say, as Mr. Weiss does, that, according to relativity, if a body were freshly created in the firmament, it would "have to wait for weeks and weeks before it could have a relation of 'bigger than' to something here on earth" (p. 527). Instead, I would state the matter as follows: a direct and immediate geometric relation obtains between the distant body and one on earth only via a previously present metrical framework whose initial construction is fully subject to Einstein's requirement of the prior transport of a standard of congruence. This reply to Mr. Weiss is unaffected by his point that independent objects "do not block one another" (p. 527) whereas the bodies in our actual world do place restrictions on one another by getting in each other's way under certain conditions. What makes Mr. Weiss's point unavailing is the fact that when bodies are about to get in each other's way, they are no longer separated spatially and they can then no longer dispose of such independence as Einstein's theory attributes to them for the case in which they *are* spatially separated!

As for an "intermeshing power" (p. 527) which ensures that "the successors of contemporary beings or states are also contemporary," it should be pointed out that far from being "beyond the knowledge of contemporary physics" the operation of such a principle has been recognized in discussions of entropy in thermodynamics, as, for example, in E. Zilsel's paper "On the Asymmetry of Causality and the Arrow of Time." * Lastly, it should be mentioned that our ability to use and affect contemporary beings, as when we speak to our associates, is, of course, due to the fact that the distances involved are insignificantly small in relation to the speed of light and of sound so that the actual time-lag which

* "Über die Asymmetrie der Kausalität und die Einsinnigkeit der Zeit," *Naturwissenschaften*, XV (1927), p. 282.

does enter is pragmatically inessential. This much for Mr. Weiss's critique of the theory of relativity. I now turn to his views on the role of teleology in the domain of existential possibility and to his treatment of individuality.

In 1925, H. Reichenbach pointed out⁹ that classical determinism does not do justice to the difference between the future and the past. For in the equations of physics, a present state determines a past state in the same sense as it determines a future one, and hence these equations affirm a complete symmetry of determination. But human behavior reveals no such symmetry with respect to the past and the future: we make plans and resolutions for tomorrow but not for yesterday; we only recall the events of yesterday. A similar view is expressed by Weiss in *Reality*¹⁰ and in *Nature and Man*.¹¹ These writers have called attention to an important feature of the world. Schlick has offered an explanation of it on the basis of entropy;¹² Reichenbach rejects that explanation¹³ and argues that the answer lies in replacing classical determinism by a statistico-determinism.¹⁴ Without passing judgment here on these rival accounts of the source of the difference between the past and the future, I endorse Mr. Weiss's renewed emphasis in the present paper on the need for allowing

⁹ H. Reichenbach, "Die Kausalstruktur der Welt und der Unterschied von Vergangenheit und Zukunft," *Sitzungsber. bayer. Akad. Wiss., Math.-physik. Kl.* (1925), p. 141. See also, Reichenbach, *Naturwiss.*, XIX (1931), p. 719.

¹⁰ (Princeton, 1938), Ch. 6.

¹¹ (New York, 1947), pp. 19, 28. See also C. F. von Weizsäcker, *The World View of Physics* (London, 1952), p. 85.

¹² M. Schlick, *Grundzüge der Naturphilosophie* (Vienna, 1948), pp. 106-7. An English translation, *Philosophy of Nature*, was published in 1949 by the Philosophical Library. See pp. 126-27.

¹³ H. Reichenbach, "Ziele und Wege der physikalischen Erkenntnis," *Handbuch der Physik*, IV (1929), pp. 61-65.

¹⁴ H. Reichenbach, "Das Kausalproblem in der Physik," *Naturwiss.*, XIX (1931), p. 719. Shortly before Reichenbach's recent untimely death in April, 1953, he dealt further with these problems in publications not available to me at this writing: see the volume of the *Annales de l'Institut Poincaré* for 1952 and his contribution to *Louis de Broglie, Physicien et Penseur* (Paris, 1952). Additional details will be found in a book about time, which may appear posthumously.

See also H. Bondi, "Relativity and Indeterminacy," *Nature*, CLXIX

for that difference in dealing with "the creative onrush of the world" (p. 528). But I wish to explain why I think that his account of existential possibility (viz., his concept of "impressed contemporaneity") fails to implement his own admonition. When he speaks of "relevant" occurrences, I presume he means those which are the effects of others (or are circumscribed by causal relations to others). Now if, upon considering existential possibility, we do take into account the difference between the past and the future, as Mr. Weiss rightly enjoins us to do, then one fact seems to stand out above all others: it is the present that limits or determines the future in the sense of precipitating out of the wide matrix of future existential possibility a particular segment which becomes actuality when the future becomes present. The converse relation of determination, which Mr. Weiss affirms, does *not* hold. For the present is already actual, and the future cannot affect it in the sense of precipitating a present actuality out of a wider matrix of present possibility. If Mr. Weiss's account of the determination of the present by the future is to be correct, then it must be correct in the *Laplacean* sense of classical determinism which obliterates the distinction between the past and the future except in the formal mathematical sense. It is only in the *Laplacean* sense of determination that Mr. Weiss is entitled to say that "only a future which now limits what is happening, so that it will have one outcome rather than another, dictates that what now occurs will be followed by a relevant occurrence." For this statement is true in the same sense and for the same reason as the statement "only a *present* which now limits what *will* happen, so that it will have one outcome rather than another, dictates that what now occurs will be followed by a relevant occurrence."

In dealing with the problem of individuation, Mr. Weiss has, I think, given us a phenomenology but not an explanatory theory. He records the subjective certainty of each one of us that we do not have a *bona fide alter ego* and points out rightly that this subjective

(1952), p. 660. Bondi writes that contrary to Einstein, the theory of relativity actually "demands a non-deterministic theory such as is given at present by quantum theory . . . *In a theory with indeterminacy, . . . , the passage of time transforms statistical expectation into real events*" (my italics). I find Bondi's argumentation in this paper entirely unconvincing.

certainty has objective validity and does *not* rest merely on the empirical fact that none of us has ever run into a duplicate of himself. Hence, our individuality does not derive from the fact that each one of us *happens* to be unduplicated, ie., is *accidentally* unduplicated. Whence does it derive then? Let me suggest that it derives, at least in part, from one of the fundamental properties of the causal structure of the world: it is existentially *impossible* rather than merely accidentally the case that any one of us have a duplicate, because nature excludes closed or self-intersecting causal lines. That is to say, nature excludes a situation in which an event E_1 is the cause of an event E_2 and E_2 also is the cause of E_1 . If nature did permit such situations, then it would indeed be possible to meet one's *alter ego* and even one's former self.¹⁸ The existential impossibility of self-intersecting causal lines is one of the most fundamental and pervasive properties of the world, and it is *this* objective property that is reflected in our subjective certainty that we have no duplicates. But since it is not impossible *a priori* that the causal structure of the world exhibit self-intersecting causal lines, it should be said that our certainty about our uniqueness is fundamentally empirical, though in a much *deeper* sense than that of the *de facto* absence of duplicates in our personal experience.

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GRÜNBAUM'S RELATIVITY AND ONTOLOGY

PAUL WEISS

MR. GRÜNBAUM has written a strong defense of a reputable interpretation of Einstein's theory of relativity. I will skip over the first comments in his critique as elementary and familiar, to con-

¹⁸ Cf. H. Reichenbach, *Philosophie der Raum-Zeit-Lehre* (Berlin, 1928), pp. 167-68.

centrate on the rest. The following, I think, are the main points of difference. They cannot, I think, be further resolved without more clarification by him.

1. Mr. Grünbaum says, "it is clearly meaningless to say that one object is larger than another unless there is a . . . common metrical framework to which . . . these bodies can be referred." But he also says, as one ought, that "sodium atoms separated by . . . light years . . . share the characteristics of sodium." Apparently he and I agree that sodium atoms, x and y , can share the characteristics of sodium without the need of an intermediary third term. Substitute "sodium similarity" for "share the characteristics of sodium" and we get " x and y have sodium similarity." Substitute "magnitude" for "sodium" and it then becomes evident that equal magnitudes can be members of two-termed relations. And since a larger body is a body, part of which has the same magnitude as the whole of another, unequal magnitudes can also, despite his denial, be related by two-termed relations. It would be foolish, of course, to deny that a metric introduces a third term. But must there not be something for the metric to measure? It was with this something my paper was concerned. I take it to be presupposed by the theory of relativity, and the theories which will follow it in the course of the history of science. Mr. Grünbaum, if I understand him, gets to his conclusion because he arbitrarily identifies "being" with "being known," "magnitude" with "measured size."

2. Mr. Grünbaum wants to preserve Newton's third law solely for contact forces. I think it has wider scope. But let us put that matter aside. Since no particles are in absolute contact, Mr. Grünbaum's restriction is tantamount to the abandonment of the law altogether, and the acceptance of the regrettable conclusion that each thing does form a universe to itself.

3. Mr. Grünbaum says that we must assert either that cause and effect are simultaneous or that a (no longer existent) past acts on (a not yet) existent effect. He takes the second alternative, and endows Aristotle and Aquinas with the first. But I have been urging a third alternative, which he does not examine: a cause is an antecedent condition related by a present process of causation to a subsequent effect.

4. Mr. Grünbaum thinks that entropy *ensures* that successors of contemporary beings are also contemporary. If so, entropy must be a fundamental, and perhaps even a metaphysically necessary truth.

5. Mr. Grünbaum rejects my contention that the future can determine the present, because he thinks that I hold that if one thing determines another, it must physically act on it. But I have been saying something quite different. The future, I have argued, is the domain of relevant possibilities which non-physically determine the present by providing it with a limit and direction.

6. Mr. Grünbaum thinks that our "individuality derives, at least in part, from . . . the causal structure of the world." Since he admits that "it is not impossible" for there to be "self-intersecting causal lines," he is driven to admit that it might be possible "to meet one's alter ego." It is this very possibility which I held was precluded not only by what Mr. Grünbaum calls the "subjective certainty of each one of us that we do not have a bona fide alter ego," but by the nature of things. He thinks that it is conceivable that he might some day meet himself coming toward himself. I think this is impossible, for each being is the other of all that lies outside itself.

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PLATO AND MILLER

ROBERT M. SCOON

THE originality of Mr. Miller's paper¹ seems to lie, first, in his bringing together of the dramatic dates of the dialogues, as worked out by Burnet and Taylor, into a single comprehensive order; secondly, in interpreting the dialogues as records of actual conversations, and accordingly attributing to the historical Socrates

¹ This journal, VI (June, 1953), pp. 551-61.

whatever is said by the character of that name in the dialogues, and thirdly, in combining these first two principles so as to get a picture of Socrates' intellectual development. The net result appears to be that Plato turns into a great historian and Socrates into a great systematic philosopher.

It was of course impossible for Mr. Miller within the limits of his paper to follow out all the implications of his position, and I merely want to raise some questions with regard to a few of the more important of these implications. If Plato assumed the role of historian, intent on giving an "accurate representation" of his characters in conversations that actually took place, it would clearly be incumbent on him to keep any independent philosophical interest of his own, if he had any, completely out of the picture—his interest in philosophy was limited to reporting what Socrates, Protagoras, Gorgias, and the others had said on various subjects. Now, the only dialogues in which Socrates does not do the constructive thinking are a small group, consisting of the *Sophist*, *Statesman*, *Timaeus*, *Critias*, *Laws*, and *Epinomis*, written towards the end of Plato's life; but I am not certain whether Mr. Miller holds that these represent a continuance of the reporting function, or a sudden outburst of originality by Plato. The question that I would ask therefore is whether Mr. Miller's thesis would imply that Plato was merely an accurate reporter of other men's opinions either all his life or at least down to the last ten or fifteen years.

Again, if the materials for Plato's history were actual conversations, we shall have to believe that both the conversational capacity and the memory of the old Greeks were something quite prodigious. The *Timaeus* speaks of the *Republic* as yesterday's discourse, so that if Plato is an accurate historian, we will have to believe not only that this large mass of material in the *Republic* with its systematic intricacy and logical development was actually talked through in a day, but also that the participants got up the next morning and produced the *Timaeus*. Furthermore think of the memorizing capacity that would be involved in storing up the vast bulk of the *Republic* and in holding fast the mass of abstract argumentation of the *Parmenides* for eighty years. Is all this possible?

Now let us turn to the portrait of Socrates as a systematic philosopher. His first appearance according to Mr. Miller's interpretation is in the *Parmenides* where he is represented as a youth of perhaps twenty who has already invented the doctrine of ideas. But according to the autobiographical section of the *Phaedo*, Socrates in his youth devoted himself to the investigation of nature, gradually became dissatisfied with this approach, turned to Anaxagoras' doctrine of mind but found this also unsatisfactory, and finally settled on what amounts to a mixture of final and formal causes. This view of Socrates' youthful interest in cosmology is supported by Aristophanes' *Clouds* which was produced in 423 B.C. when Socrates was forty-seven, and which makes fun of him as a queer amalgam of physical scientist, spiritualist, and sophist. Xenophon (*Mem.* IV, 7,3-5) also maintains that Socrates was versed in scientific theories. Now if this was the case, is it possible to suppose that Socrates "began his philosophizing as a metaphysician" and had produced the theory of ideas by the age of twenty?

Incidentally, it seems as difficult to interpret the *Parmenides* as a faithful representation of the historical Parmenides as it does of the historical Socrates. Parmenides took a very definite stand on "what needs must be," whereas the character in the dialogue talks in terms of hypotheses; Parmenides' central idea was "what is," a single, eternal, indivisible sphere, which is not the same as "the one" hypothesized in the dialogue. And similar difficulties arise in equating the Zeno of the dialogue with the historical personage of that name. In the light of all these difficulties, is it plausible to suppose that Plato is resurrecting an actual discussion which took place eighty years before?

Again, in some of the early dialogues which represent the old Socrates, he is made to say that he himself knows nothing but merely performs the function of showing up the ignorance of others and then stimulating them to start thinking. But is it possible to accept this picture if he has already produced the system of philosophy expounded in the ten books of the *Republic*? And is it possible to interpret Plato as a faithful historian in putting out both these representations?

Finally, there is the testimony of Aristotle, who never knew

Socrates but associated with Plato for twenty years, and whose information presumably represents the tradition in the Academy after the emotional reactions to Socrates' death had cooled. For Aristotle the author of the theory of ideas was Plato, who adapted it from Pythagorean doctrines; and for Aristotle, Socrates' contributions to philosophy lay in his concern with ethical problems and with definitions. Granting that Aristotle wrote history from the point of view of his own prepossessions, still can we say that he was simply completely wrong about both Plato and Socrates?

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PLATO AND SCOON: A REPLY

JAMES W. MILLER

SOME of Mr. Scoon's criticisms depend upon taking the word "historian" in a pedestrian sense that I did not intend. Certainly I did not mean to imply that during most of his life Plato was a mere reporter of other men's opinions or that the dialogues are to be regarded as verbatim transcripts of actual conversations.

In the case of the *Parmenides*, I thought that I had sufficiently protected myself by saying that the details were not to be pressed. But, if I am required to take Plato's version of Parmenides *au pied de la lettre*, I can still reply that quite possibly it is historically accurate, that scholars know far less about Parmenides than they could wish, that perhaps they have erred in not taking Plato's testimony into serious account in their reconstruction of the philosophy of Parmenides, and that perhaps Plato's dialogue—in which Parmenides is old—represents a late stage in the development of Parmenides' philosophy whereas the fragments of the poem come from an earlier period.

The objection concerning the *Republic* and the *Timaeus* ignores the Greek love of philosophy and of conversation. What is so extraordinary about Greeks spending two whole days or even

three (cf. *Rep.* 327 a 1) talking and hearing philosophy? And, if we insist that Socrates must have been exhausted after dominating the discussion throughout the *Republic*, let us recall that Plato allows him to rest in the *Timaeus* and entrusts the leadership to a fresh speaker, Timaeus himself. As to the feat of memory involved in "storing up the vast bulk of the *Republic*," we must not overlook the fact that the Greeks made a practice of memorizing and repeating Socratic conversations and that, depending on the written word far less than we, they had as their reward memories far superior to ours. As a matter of fact, this whole line of objection is pertinent only to a view much more radical than my own, to the view, which I presume nobody holds, that the dialogues are virtually word for word reports of actual conversations. The most that I could possibly suppose is that they are Plato's rendition of the essential content of such conversations; and in my present paper there is no need of my supposing even that much. All that I need maintain in order to provide a basis for tracing the development of the philosophy of Socrates and all that in fact I do maintain in my paper is that the dialogues are faithful to the philosophy of Socrates as of the times at which they are laid. To that view the present objection is entirely irrelevant.

Mr. Scoon, quite properly, presses me on my attitude towards the later dialogues. If the *Theaetetus* and the *Philebus*, in addition to the first part of the *Parmenides*, are to be considered Socratic, as I suggest but do not actually maintain in the paper, then indeed the only dialogues in which Plato sets forth his original philosophy are few and late; but that does not force us to assume a "sudden burst" of originality in Plato's old age. It is to be supposed, rather, that Plato himself was a devoted believer in the Socratic philosophy in his earlier years, that his originality developed slowly and gradually, and that many of his ideas matured over a long period before he presented them in the *Sophist*, the *Statesman*, and the *Laws*.

The fragment of autobiography in the *Phaedo* is entirely consistent with the first part of the *Parmenides*. These two accounts of the young Socrates supplement each other, though they leave some questions unanswered. Reminiscing in the *Phaedo*, Socrates tells us that as a young man—presumably in his

teens—he devoted himself to what we should call natural science. From the *Parmenides* we learn that by the age of twenty he held the Theory of Ideas and in particular the doctrine of participation. There is no difficulty here. Devotion to science does not preclude creative work in philosophy. Moreover, I hold with Burnet that the Theory of Ideas originated with the Pythagoreans; the contribution which Socrates had made by the age of twenty was the doctrine of participation. We learn from the *Phaedo* that in some sense and at some time Socrates abandoned science. In what sense? Surely not in the sense of a loss of interest. The *Clouds* of Aristophanes and certain passages of Xenophon, which Mr. Scoon cites, and, as I should add, the myths of the *Republic*, the *Phaedrus*, and the *Phaedo*, make it clear that Socrates retained his interest in natural science throughout his life. Socrates' abandonment of science consisted in his recognition that he would never find "the cause" (i.e., the ultimate cause) in science, that it was to be found only in philosophy. When did that abandonment take place? Possibly by the age of twenty. But quite possibly some years later: the fact that when Socrates abandoned science he turned to the Theory of Ideas in *his search for the cause* does not imply that he had not previously adopted the theory.

Socrates' professed ignorance is a fundamental characteristic of the man as Plato portrays him: it appears in all periods of Plato's writing and in all stages of the life of Socrates. It is (1) partly a mannerism, (2) partly a dialectical device, (3) partly an indication of Socrates "at work," as in the *Charmides* and the *Laches*, and (4) partly an expression of Socrates' genuine modesty, —even after his "system" has been elaborated he is deeply aware that his ignorance exceeds his knowledge.

This is not the occasion to discuss the complicated problem of Aristotle's attitude toward Socrates and Plato. Here I shall say simply that one should not permit the obscure and ambiguous testimony of Aristotle to becloud the clear internal evidence of Plato's dialogues.

I regret that the time limit to which my paper was subject prevented me from reminding my hearers of more than one of the many arguments in favor of Burnet's principle. These arguments convince me that Burnet's principle is the only way of making

sense of the Platonic dialogues. Once that is granted, my extension of the principle is the nearly inevitable next step. The latter part of my paper, which Mr. Scoon's commentary does not stress, is, I believe, a confirmation of that extension.

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EXPLORATIONS

THE SCEPTICAL CRISIS AND THE RISE OF MODERN PHILOSOPHY: I

RICHARD H. POPKIN

IN almost all of the present day accounts of the rise of modern philosophy, no attention is given to the role played by the revival of the classical Greek sceptical view called Pyrrhonism. This type of scepticism is considered as an interesting ancient view bearing some similarity to certain contemporary forms of empiricism or positivism. But Pyrrhonism is practically never thought of in present day writings as a possible link between the philosophies of the Renaissance and the new world of philosophy of the 17th and 18th centuries. In Friedrich Ueberweg's *Grundriss der Geschichte der Philosophie*, the standard reference work on the history of philosophy, Pyrrhonism is almost entirely ignored as a modern movement or influence. Sextus Empiricus, the sole surviving representative of Pyrrhonism, is referred to in the volume on philosophy from 1500-1800 only in connection with an alleged translation of 1650.¹ The same is true of the earlier monumental works of historical scholarship in philosophy of the 19th and 20th centuries. They all briefly discuss the Renaissance interest in Pyrrhonism, especially with reference to Montaigne, which they treat as an odd movement prior to and independent of the rise of the "new" philosophy.² In the 1948 French edition

¹ Friedrich Ueberweg, *Grundriss der Geschichte der Philosophie*, Vol. III, *Die Philosophie der Neuzeit bis zum Ende des xviii. Jahrhunderts*, completely reedited by Dr. Max Frischeisen-Köhler and Dr. Willy Moog (Berlin, 1924), p. 168. There is a brief discussion of scepticism in pp. 161-69, and occasional mentions of it in the subsequent sections on Gassendi and Mersenne, pp. 169-71 and 174-82.

² See, for example, Kuno Fischer, *Descartes and His School* (London, 1887), pp. 119-20; Wilhelm Windelband, *A History of Philosophy* (New York, 1893), pp. 361-63; Richard Falckenberg, *Geschichte der neueren*

of Sextus Empiricus, the first since 1735, a chapter occurs in the introduction on the modern influence of Sextus Empiricus and Pyrrhonism, but it is entirely restricted to their influence on religious thought.³ Léon Robin's study (1948) on Pyrrhonism considers its modern influence only on Montaigne and Pascal.⁴ In a more recent work, Mayer's *History of Philosophy* (1951), Pyrrhonism is treated as a very important and influential classical view, but nothing whatever is said of its modern influence.⁵

This wall of silence has been broken in only a few instances. Pillon and Picavet in the 1890's gave some scant indication of the influence of Pyrrhonism on some aspects of modern philosophy.⁶ Various literary historians have traced the influence on Montaigne and scepticism on the general point of view of the 17th century.⁷

Philosophie, 6th ed. (Leipzig, 1908), pp. 45-47; Alfred Weber, *History of Philosophy* (New York, 1925), p. 218, and Emile Bréhier, *Histoire de la Philosophie*, Vol. I, Fas. III (Paris, 1932), pp. 760-65.

One major exception to this trend is Ernst Cassirer's *Das Erkenntnisproblem in der Philosophie und Wissenschaft der neueren Zeit*, Vol. I (Berlin, 1922), pp. 172-200, where Montaigne and scepticism are treated at length. However, the influence of Pyrrhonian thought on 17th century epistemology is by and large ignored.

³ Sextus Empiricus, *Œuvres choisies*, translated by Jean Grenier and Geneviève Goron (Paris, 1948), Introduction by Jean Grenier, section III, pp. 21-33.

⁴ Léon Robin, *Pyrrhon et le Scepticisme grec* (Paris, 1944), conclusion.

⁵ Frederick Mayer, *A History of Ancient and Medieval Philosophy* (New York, 1950), Chap. xviii, pp. 261-85, especially pp. 261-62.

⁶ Cf. F. Pillon, "L'évolution de l'idéalisme au xviii^e siècle. L'idéalisme de Lanion et le scepticisme de Bayle," *L'Année philosophique*, VI (1895), esp. pp. 185-94. Fr. Picavet, articles "Bayle," "Pyrrhon," and "Scepticisme" in *La Grande Encyclopédie*, (Paris, n.d.), Vol. V, pp. 947-52, Vol. XXVII, pp. 1075-76, and Vol. XXIX, pp. 717-25.

⁷ Cf. Pierre Villey, *Montaigne devant la Postérité* (Paris, 1935); François-Tommy Perrens, *Les Libertins en France au xvii^e siècle* (Paris, 1899); Jacques Denis, *Sceptiques ou Libertins de la première moitié du xvii^e siècle* (Caen, 1884); Henri Busson, *Les Sources et le Développement du Rationalisme dans la Littérature française de la Renaissance (1533-1601)* (Paris, 1922), and *La Pensée religieuse française de Charron à Pascal* (Paris, 1933); Alan M. Boase, *The Fortunes of Montaigne, a History of the Essays in France, 1580-1669* (London, 1935); René Pintard, *Le Libertinage érudit dans la première moitié du xvii^e siècle*, 2 vols. (Paris, 1943); Antoine Adam, *Histoire de la Littérature française au xvii^e siècle. L'époque d'Henri IV et*

The studies, especially those of Boase, Busson, and Pintard, have indicated the tremendous importance of Montaigne's scepticism in the creation of the intellectual atmosphere of the 17th century. Pintard, Lenoble, and Brunschvicg have, in the last decade, shown certain specific ways the Pyrrhonism of Montaigne and others led to certain features of the views of the early rationalists.* Brunschvicg has pointed out that the scholars of Montaigne have failed to read Descartes, and vice versa, and hence have failed to see the link between them.⁹ In this study I shall try to show that the link is far stronger than has hitherto been supposed, and that the writings of Montaigne and Sextus Empiricus played a vital role in shaping the central problems and answers of the new philosophy of 17th century rationalism, and further that the modern Pyrrhonian tradition continued its influence in the sceptical attacks against modern rationalism of Pierre Bayle and David Hume.

The attitude of modern historians of philosophy towards the role played by Pyrrhonism in the rise of modern philosophy is in sharp contrast with the interpretations of writers in the 17th and 18th centuries, a fact which seems to be unknown to modern scholars. Editions of the writings of Sextus Empiricus were published in 1562, 1569, 1621, 1718, 1725, and 1735.¹⁰ The

de Louis XIII (Paris, 1948), esp. Part II, Chap. ii; Louis I. Bredvold, *The Intellectual Milieu of John Dryden* (Ann Arbor, 1934), *University of Michigan Publications*, Vol. XII, and Louis Bredvold's introduction to *The Best of Dryden* (New York, 1933), pp. xxv-xxxiv.

* Pintard, *Le Libertinage*, esp. Part I, Chap. ii; Robert Lenoble, *Mersenne ou la Naissance du Mécanisme* (Paris, 1943), esp. pp. 190-95, and Léon Brunschvicg, *Descartes et Pascal, Lecteurs de Montaigne* (New York and Paris, 1944). François Bouillier's *Histoire de la Philosophie cartésienne*, Vol. I (Paris, 1868), p. 20, briefly sketches out the relationship of Montaigne to 17th century rationalism.

⁹ Brunschvicg, *op. cit.*, pp. 151-52.

¹⁰ Sextus Empiricus, *Pyrrhonianum Hypotyposeon*, edited and translated by Henricus Stephanus (Florence, 1562); *Adversus Mathematicos*, edited and translated by Gentian Hervetus (Paris and Antwerp, 1569). This work also contains the earlier translation of Stephanus. (An edition of 1601 of the Hervetus edition is listed as published in Paris in the article on "Sextus Empiricus" in the *Bibliographie Universelle*, Vol. XLII (Paris, 1825), p. 198). This first edition of the Greek text, along with the previous Latin translations, was *Opera quae extant*, ed. by Peter and Jacob Chouët

arguments of Sextus were explicitly propounded by Michel de Montaigne,¹¹ Pierre Charron,¹² Bishop Jean-Pierre Camus,¹³ Léonard de Marandé,¹⁴ Petrus Gassendi,¹⁵ Sir Walter Raleigh,¹⁶

(Paris, 1621). Another complete edition of Sextus appeared in 1718, *Opera, graece et latine*, edited by Jo. Albertus Fabricius (Leipzig, 1718). An English edition of the *Hypotyposes* was apparently issued around 1590. Cf. Thomas Nashe, *The Works of Thomas Nashe*, ed. by Ronald B. McKerrow (London, 1910), Vol. III, p. 332, and Vol. IV, p. 428. The entire text of the *Hypotyposes* appeared in English as part of Thomas Stanley's *The History of Philosophy* (London, 1656-59), and second edition in 1687. The section on scepticism, part twelve, contains the translation, entitled "A summary of Scepticism, *Sexti Empirici, Pyrrhoneae Hypotyposes*." A French translation of Sextus, entitled *Les Hypotyposes ou institutions pirroniennes*, edited and translated by Claude Huart, was published in Amsterdam in 1725 and reissued from London in 1735.

¹¹ Michel de Montaigne, "Apologie de Raymond Sebond," Book II, Chap. xii of *Les Essais de Michel de Montaigne*, Vol. II, ed. by Pierre Villey (Paris, 1922).

¹² Pierre Charron, *Les Trois Vérités, contre tous Athées, Idolâtres, Juifs, Mahumetans, Hérétiques et Schismatiques*, first published in Paris in 1593, and *De la Sagesse*, first published in 1601 in Paris. Cf. John Owen, *The Sceptics of the French Renaissance* (London, 1893), chapter on Charron, especially p. 573.

¹³ Jean-Pierre Camus, "Essai sceptique à Monsieur Tambonneau de Courcelles," in *Les Diversités de Messire Jean Pierre Camus, évêque et seigneur de Belley* (Paris, 1609-1618), Vol. IV, Book XV, Chap. iii. This work was first published in 1610, and apparently written in 1603 or 1604. It is described in Boase, *Fortunes of Montaigne*, pp. 125 ff., and Villey, *Montaigne devant la Postérité*, Chap. x.

¹⁴ Léonard de Marandé, *Jugement des actions humaines* (Paris, 1624), reissued 1635. This work is described in Boase, *Fortunes of Montaigne*, Chap. xv, and Pintard, *Le Libertinage*, pp. 68-69.

¹⁵ Petrus Gassendi, *Exercitationes Paradoxicae Adversus Aristoteleos*, in *Opera Philosophica* (Florence, 1727), Vol. III, especially Book II, Exercitatio VI, art. 7; and *Syntagma Philosophicum in Omnia Opera*, Vol. I (Lyon, 1658), Book II, Chap. iii. An account of the materials contained in the latter is given in Richard H. Popkin, "Samuel Sorbière and the French Translation of Sextus Empiricus," *Journal of the History of Ideas*, forthcoming.

¹⁶ Sir Walter Raleigh, "His Sceptick," in *Remains of Sir Walter Raleigh* (London, 1657). This work is a translation of part of Chap. xiv, Book I of Sextus's *Hypotyposes*. Cf. G. T. Buckley, *Atheism in the English Renaissance* (Chicago, 1932), pp. 146-49, and Ernest A. Strathmann, *Sir Walter Raleigh, A Study in Elizabethan Skepticism* (New York, 1951), p. 224.

François de La Mothe Le Vayer,¹⁷ Samuel Sorbière,¹⁸ Joseph Glanvill,¹⁹ Bishop Pierre-Daniel Huet,²⁰ and Pierre Bayle²¹ during the 16th and the 17th centuries. Volumes explicitly refuting Sextus Empiricus were written by Father Mersenne,²² Wilhelm

¹⁷ Almost all of his works deal with Pyrrhonian themes. The clearest and best discussions of the themes in Sextus occurs in François de La Mothe Le Vayer, *Cinq Dialogues fait à l'imitation des Anciens, par Oratius Tubero* (Mons, 1671). (René Pintard, in his *La Mothe Le Vayer, Gassendi, Guy Patin. Etudes de Bibliographie et de Critique, suivies de textes inédits de Guy Patin* [Paris, 1943], dates the original publication of the two main sets of dialogues at 1630 and 1633. Cf., pp. 5-13.)

¹⁸ Samuel Sorbière, *Lettres et Discours de M. de Sorbière sur diverses matières curieuses* (Paris, 1660), pp. 151-81, and the unpublished letter to de la Chevalerie, Bibliothèque Nationale Ms. fr. 15209, f° 157. These letters consist of translations of parts of the *Hypotyposes* of Sextus and summaries of part. For further details on their contents see Richard H. Popkin, *op. cit.*

¹⁹ Joseph Glanvill, *The Vanity of Dogmatizing or Confidence in Opinions, manifested in a Discourse of the Shortness and Uncertainty of our Knowledge, and its Causes; with some Reflexions on Peripateticism, and an Apology for Philosophy* (New York, 1931), (original edition 1661); *Scepsis Scientifica or, Confest Ignorance, The Way to Science; in an Essay of the Vanity of Dogmatizing and Confident Opinion* (London, 1885), (original edition 1665); "Against Confidence in Philosophy" and "Of Scepticism and Certainty" in *Essays on Several Important Subjects in Philosophy and Religion* (London, 1676).

Glanvill's use of materials from Sextus Empiricus is discussed in Ferris Greenslet, *Joseph Glanvill* (New York, 1900), pp. 96 ff. A general summary and analysis of Glanvill's scepticism appears in Richard H. Popkin, "Joseph Glanvill: a Precursor of David Hume," *Journal of the History of Ideas*, XIV (1953), pp. 292-303.

Glanvill's opinions were called "that deadly Pyrrhonic poison," by his 17th century opponent, Thomas White, quoted in "Pyrrhonism of Joseph Glanvill," *Retrospective Review*, I (1853), p. 106.

²⁰ Pierre-Daniel Huet, *Traité philosophique de la Foiblesse de l'Esprit humain* (London, 1741). According to the introduction, p. vii, this work was written around 1690. It was first published in 1723. It was answered by Lodovico Ant. Muratori's *Delle Forze dell' Interdimento Umano, o sia il Pirronismo confutato* (Venice, 1745).

²¹ Pierre Bayle, *Dictionnaire historique et critique* (Paris, 1820, first published 1697-1702), Vol. XII, art. "Pyrrho," pp. 102-07, and art. "Zenon," Vol. XV, p. 49.

²² Marin Mersenne, *La Vérité des Sciences contre les Sceptiques ou Pyrrhoniens* (Paris, 1625), Book I. In the forthcoming paper, "Samuel Sorbière and the French Translation of Sextus Empiricus," I have examined the extent that the views of Sextus are summarized in this work.

Langius,²³ and Jean-Pierre de Grousaz.²⁴ Many other writers like Boyle, Cudworth, and Hume, quoted from Sextus Empiricus.²⁵ Among the many people who discussed Pyrrhonism were René Descartes,²⁶ Jean de Silhon,²⁷ Blaise Pascal,²⁸ Cyrano de Bergerac,²⁹ Antoine Arnauld,³⁰ Father Malebranche,³¹ Father Mauduit,³² the

²³ Wilhelm Langius, *De Veritatibus Geometricis adversus Sextum Empiricum* (Copenhagen, 1656).

²⁴ Jean-Pierre de Crousaz, *Examen du Pyrrhonisme ancien et moderne* (La Haye, 1733). Extracts of this work appeared in Jean-Henri-Samuel Formey, *Le Triomphe de l'Evidence* (Berlin, 1756).

Crousaz's work is briefly treated in Richard H. Popkin, "David Hume and the Pyrrhonian Controversy," this journal, VI (1952-1953), pp. 71-73.

²⁵ Robert Boyle, *A Free Inquiry into the Vulgarly Received Notion of Nature*, in *The Works of the Honorable Robert Boyle* (London, 1772), Vol. V, p. 184. Bredvold, *Intellectual Milieu of John Dryden*, p. 63, says this work was written about 1666.

Ralph Cudworth, *The True Intellectual System of the Universe* (London, 1845), Vol. II, pp. 566-67, and Vol. III, pp. 568-69. (This work was first published in 1679.)

David Hume, *An Enquiry concerning the Principles of Morals in Essays and Treatises on Several Subjects* (London, 1768), Vol. II, p. 286. Sextus is referred to on p. 255, in *The Natural History of Religion in Essays and Treatises*, Vol. II, pp. 453 and 491, and in the essay, "Of the Populousness of Antient Nations," in *Essays and Treatises*, Vol. I, p. 444.

Sextus Empiricus is mentioned though not quoted by Gottfried W. Leibniz in *Textes Inédits*, by Gaston Grua (Paris, 1948), Vol. I, p. 42.

²⁶ René Descartes, *Recherches de la Vérité par la lumière naturelle*, in *Œuvres*, edited by Adam and Tannery (Paris, 1897-1910), Vol. X, pp. 512 and 519-20.

²⁷ Jean de Silhon, *De l'Immortalité de l'Ame* (Paris, 1634), and *De la certitude des Connoissances Humaines* (Paris, 1661). These works are discussed in Boasse, *Fortunes of Montaigne*, Chap. xiv, and Pintard, *Le Libertinage*, pp. 67-68.

²⁸ Blaise Pascal, "Pensées," in *Pensées et Opuscules*, ed. by Brunschvicg (Paris, 1946), esp. pp. 499-508, and 527-34, Nos. 373-95 and 432-34.

²⁹ Cyrano de Bergerac, *Histoire comique, contenant les Etats et Empires de la Lune* (Paris, 1657), Préface to Le Bret. Cf. Pintard, *Le Libertinage*, pp. 329-30.

³⁰ Antoine Arnauld, *La logique ou l'Art de Penser*, 6th ed. (Paris, 1724), pp. xx-xxi, Part IV, Chap. i, pp. 342-43, and Part IV, Chap. vi, p. 378.

³¹ Nicholas Malebranche, *De la Recherche de la Vérité*, 2nd ed. (Paris, 1675), Book II, Preface "Pour servir de réponse à la critique du 1^{er} volume," and Book II, Part III, Chap. v, "Du Livre de Montaigne."

³² Michel Mauduit, *Traité de Religion contre les Athées, les Déistes et les nouveaux Pirrhoniens* (Paris, 1677). This work went through several editions. The last was an augmented one issued in Paris, 1698.

Chevalier Ramsay,³³ Abbé Foucher,³⁴ Andrew Baxter,³⁵ Archbishop Fénelon,³⁶ and Friedrich Bierling.³⁷ In discussions in the 17th and 18th centuries of the rise of modern philosophy, Pyrrhonian influences are often given a very prominent role. Arnauld considered Pyrrhonism a chief opponent of Cartesianism.³⁸ Bayle, the self-styled "Defenseur de Pyrrhonisme," saw this type of scepticism as both the inspiration and conclusion of modern thought.³⁹ Most of the encyclopedias and dictionaries and histories of philosophy of the period treated Pyrrhonism as both an important ancient and modern philosophy. Bayle's *Historical and Critical Dictionary* introduced discussions of Pyrrhonism in modern thought as often as possible.⁴⁰ Jacob Brucker's *Historia Critica Philosophiae* gave a long account of it with a sketch of some of its modern forms.⁴¹ Ephraim Chambers' *Universal Cyclopaedia* claimed that many of the Cartesian arguments were drawn from Pyrrhonian sources.⁴² Denis Diderot gave a

³³ Andrew Michael Ramsay, *Voyages de Cyrus* (Paris, 1807), Book VI, pp. 228-35. This work first appeared in 1727.

³⁴ Simon Foucher, *Critique de la "Recherche de la Vérité"* (Paris, 1675), and *Réponse pour la Critique, à la préface du second volume de la Recherche de la Vérité* (Paris, 1676).

³⁵ Andrew Baxter, *An Enquiry into the Nature of the Human Soul*, 2nd ed. (London, 1737), esp. Vol. I, pp. 358-59, and note (b), pp. 363-65, and Vol. II, pp. 272-76 and note (f), p. 321 and note (z), and p. 326.

³⁶ François de Salignac de la Mothe Fénelon, *Œuvres*, Vol. I (Versailles, 1820), pp. 350-52, and Vol. XIX (Paris, 1823), pp. 246-48.

³⁷ Friedrich W. Bierling, *Commentatio de Pyrrhonismo historico* (Leipzig, 1714).

³⁸ Arnauld, *L'Art de Penser*, Part IV, esp. Chap. vi, p. 378.

³⁹ Cf. Bayle, *Dictionnaire historique et critique*, Vol. XIII, art. "Pyrrhon," Rem. B, pp. 101-05, and Vol. XV, art. "Zenon," Rem. G, pp. 41-49, and Bayle's letter to Minutoli, January 31, 1673 in Pierre Bayle, *Œuvres diverses*, Vol. IV (La Haye, 1737), pp. 539-43. Part of this letter appears in Marcel Raymond's recent edition of selections from Bayle, *Pierre Bayle* (Paris, 1948), pp. 47-51.

⁴⁰ Cf. Bayle, *Dictionnaire historique et critique*, Vol. XVI, pp. 513-14, for the various items in the index under "Pyrrhon," "Pyrrhoniens," and "Pyrrhonisme."

⁴¹ Jacob Brucker, *Historia Critica Philosophiae* (Leipzig, 1767), second edition, Vol. 1, pp. 1317-49.

⁴² Ephraim Chambers, *Universal Cyclopaedia*, Vol. II (London, 1743), article "Scepticism." Here Chambers stated that Descartes borrowed his

lengthy and laudatory account of modern Pyrrhonism in the article on "Pyrrhonisme" in the *Encyclopédie*.⁴³ Some charged Job and Solomon with being sceptics of this stripe, and one German critic even went so far as claiming "the devil [was] the author thereof, who made our first parents doubt of the word of God himself; and drew them in, the first proselytes to *scepticism*." "The preface to the French edition of Sextus Empiricus in 1725 tried to justify further popularizing this type of scepticism by showing the distinguished tradition of modern philosophers who held this point of view."⁴⁴ Buhle's *Geschichte der Philosophie*, (1800-04), gave the ancient and modern Pyrrhonists a most prominent role.⁴⁵ Some critics of Bishop Berkeley interpreted his idealism as a misguided attempt to answer the Pyrrhonists which ended up by

great principle of doubting all things from the acatalepsia of the sceptics, "as is owned by many of his followers." (As in most 17th and 18th century writings, Chambers explicitly uses "sceptic" and "Pyrrhonist" as equivalent, and both as different from "Academic").

⁴³ *Encyclopédie, ou Dictionnaire raisonné des sciences, des arts et des métiers*, Vol. XIII (Neufchâtel, 1765), pp. 611b-613b.

⁴⁴ Cf. Chambers, *Universal Cyclopaedia*, Vol. II, article "Scepticism." Chambers only identified this critic of demonology as "the philosopher of Kiel." More material on Pyrrhonism appears in Chambers' article "Pyrrhonists."

⁴⁵ Sextus Empiricus, *Les Hypotyposes ou institutions pirroniennes en trois livres, traduites du grec* (Amsterdam, 1725), preface, p. 3, note (a). Those listed are Charron, Montaigne, La Mothe Le Vayer, Gassendi, Bayle, and Huet. The preface and translation are attributed by A. A. Barbier's *Dictionnaire des ouvrages anonymes*, 3rd ed. (Paris, 1882), Vol. II, p. 628, to Claude Huart, a teacher of mathematics in Geneva. Some data about his Pyrrhonian proclivities is given in Jean-Pierre de Crousaz's *La logique ou Système de Réflexions*, 4th ed. (Lausanne and Geneva, 1741), Vol. V, pp. 129-33.

⁴⁶ Johann Gottlieb Buhle, *Geschichte der Philosophie* (Göttingen, 1800-1804). The first part of Vol. I, pp. 9-564, is entitled "Allgemeine Übersicht der Philosophie der Griechen bis auf Sextus den Empiriker." The section on Pyrrhonism is pp. 446-564. In Vol. II, Buhle deals with Montaigne, Charron, Sanchez, Hirnhaym, and La Mothe Le Vayer, pp. 910-25 and 938-50. Gassendi, Huet and Glanvill are treated in Vol. III, pp. 86-222 and 346-58. In Vol. IV, Bayle is considered on pp. 32-106. Crousaz's criticism of Pyrrhonism appears in Vol. V, pp. 45-57.

Buhle also published a translation of the *Hypotyposeon* into German in 1801. Cf. F. A. Ebert, *Allgemeines bibliographisches Lexikon* (Leipzig, 1830), p. 776, No. 21074.

advocating that catastrophic view.⁴⁷ Crousaz saw the strength of modern Pyrrhonism as a most dangerous malady of spirit due to certain new psychological, cultural, and religious aberrations.⁴⁸ The Dutch Reformed Church councils and the English translators of Bayle's *Dictionary* saw too dangerous an advocacy of Pyrrhonism in the *Dictionary*.⁴⁹ The French reviewer of Hume's *A Treatise of Human Nature* interpreted that great work as just one more tract in favor of Pyrrhonism whose main arguments had already appeared in the writings of Sextus Empiricus.⁵⁰ The Abbé Foucher saw the main task of the "new" philosophy of the Cartesians that of refuting the Pyrrhonian and the Academic sceptics.⁵¹ In summary, a great many of those who lived through the birth pangs of modern thought saw Pyrrhonian scepticism as a source of certain problems and as either the *bête noire* of the new philosophy, the spectre haunting European thought, or as the ultimate modern philosophy.

Who is correct—the contemporary historian who ignores

⁴⁷ Cf. Andrew Baxter, *An Enquiry into the Nature of the Human Soul*, Vol. II (London, 1737), 2nd ed., Section II, pp. 256-344; Crousaz, *Examen du Pyrrhonisme*, p. 97; David Hume, *An Enquiry Concerning Human Understanding* Selby-Bigge ed. (Oxford, 1951), p. 155n; and James Beattie, *An Essay on the Nature and Immutability of Truth, in Opposition to Sophistry and Scepticism*, in *Essays* (Edinburgh, 1776), Part II, Chap. ii, Sec. 2, pp. 187-89. The relation of Berkeley to 17th century Pyrrhonism is treated in Richard H. Popkin, "Berkeley and Pyrrhonism," this journal, V, pp. 223-46.

⁴⁸ Crousaz, *Examen du Pyrrhonisme*, Part I, pp. 1-48.

⁴⁹ The views of the Dutch Reformed Church appear in the "Life of Mr. Bayle" by Pierre Desmaizeux and the "Acts of the Consistory of the Walloon Church of Rotterdam, concerning the Sieur Bayle's Historical and Critical Dictionary," in the 1734-38, London English edition of the *Dictionary*, Vol. I, pp. lxxvii-lxxxvii, and cxxii-cxxviii.

See also the end of the preface to the 1734-41, English edition of the *Dictionary*, Vol. I (London, 1735).

⁵⁰ *Bibliothèque Raisonnée des Ouvrages des Savans de l'Europe*, XXIV, (1740), pp. 324-54, especially pp. 328, 337, and 353-55.

⁵¹ Foucher, *Critique de la Recherche de la Vérité*, pp. 17-18, 22, 26-27, and 31; and *Réponse pour la Critique à la Préface du Second Volume de la Recherche de la Vérité* (Paris, 1676), p. 19; and Bouiller, *Histoire de la Philosophie cartésienne*, Vol. II, p. 383, where one of Foucher's main attacks on Malebranche is that the search for truth assumes that truth exists, and this is "ce qu'on ne pouvait prouver, sans réfuter d'abord Sextus Empiricus."

Pyrrhonism as a force in the development of modern thought, or the 17th and 18th century thinkers who saw it as a living force in the emergence of modern thought? It will be the burden of this paper to try to vindicate the 17th and 18th century evaluations.

What I shall attempt to show is that a crisis of thought occurred in the late 16th and early 17th centuries, *une crise pyrrhonienne*,⁵² by which all knowledge was cast in doubt, and that this crisis was due in large measure to the publication of the writings of Sextus Empiricus. Modern philosophy arose in part as a reaction to this crisis, due to the efforts of thinkers like Father Mersenne, Lord Herbert of Cherbury, Petrus Gassendi, and René Descartes. Throughout the 17th and early 18th centuries a running battle was fought with the Pyrrhonists to prevent a reoccurrence of this crisis, with the Pyrrhonists finally triumphing through the efforts of Pierre Bayle and David Hume. A turning point in the history of philosophy was reached by Hume's evidence that Pyrrhonism could not be refuted. Hence a future development of philosophy after Hume required a new approach via Kant and Hamann. The debt that modern philosophy owes to its Pyrrhonian ancestors has not been recognized and is hardly remembered.

The historical commencement of interest in scepticism in modern times starts with the use of sceptical arguments in the Renaissance. These arguments were offered to challenge the old Dogmatism of the Scholastics, or the new Dogmatism of the Calvinists. Rabelais had introduced a Pyrrhonist as a character in his *Gargantua and Pantagruel*.⁵³ Sceptics like François Pico della Mirandola, the nephew of the great humanist, Cornelius Agrippa von Nettesheim, Omer Talon, and others had employed various classical arguments of the Pyrrhonian and Academic

⁵² This term was introduced by Pierre Villey-Desmeserets in his *Sources et Evolution des Essais de Montaigne* (Paris, 1908), Vol. II, p. 230, to describe what he believed happened to Montaigne on reading Sextus Empiricus.

⁵³ François Rabelais, *Le Tiers Livre des Faicts et Dicts Heroiques du bon Pantagruel*, ed. by Jean Plattard (Paris, 1929), Chaps. xxv-xxvi, pp. 159-67.

The conception of the Pyrrhonic philosopher here is fairly far afield from his classical predecessors.

sceptics in order to criticize either the scholastic attitude towards knowledge, or to show the vanity involved in the dogmatic pronouncements of the Reformation leaders.⁵⁴ The strongest impact of Pyrrhonian views in the 16th century occurred after the publication in Latin of the *Hypotyposes* of Sextus Empiricus by Henri Estienne in Florence in 1562, and the publication also in Latin of Sextus *Adversus Mathematicos* by Gentian Hervetius in 1569. What made the appearance of these texts important in the history of thought was the influence they had on Michel de Montaigne. Besides Montaigne's interest in Pyrrhonism there are few signs that these editions elicited much excitement. Montaigne's disciple Pierre Charron read and used his Sextus to carry on the sceptical attitude of his mentor.⁵⁵ Jean-Pierre Camus, later Bishop of Belley, used the writings of Sextus, Montaigne, and Charron, as the basis of the views presented in his *Essai Sceptique*.⁵⁶ The others whom I shall discuss shortly, who were influenced directly by reading Sextus Empiricus, apparently read a later edition.

According to the famous scholar of the sources and development of Montaigne's *Essais*, Pierre Villey, the greater part of that remarkable essay, *Apologie de Raymond Sebond*, was written in 1575-76 during the period when Montaigne had *une crise pyrrhonienne* due to reading Sextus Empiricus.⁵⁷ Montaigne was so impressed by what he read there that he had phrases from it carved in the rafters of his study. In the *Apologie de Raymond Sebond* he presented a great deal of the Pyrrhonian point of view

⁵⁴ Cf. Villey, *Sources et Evolution des Essais de Montaigne*, Vol. II, pp. 156-82; Strowsky, *Montaigne*, Chap. iv, pp. 118-46; Bréhier, *Histoire de la Philosophie*, Vol. I, fasc. iii, pp. 760-65; Busson, *Sources et Développement du Rationalisme*, pp. 258-64, and Bredvold, *Intellectual Milieu of John Dryden*, pp. 28-29.

⁵⁵ Cf. Owen, *Skeptics of the French Renaissance*, p. 573. On Charron's scepticism see also Villey, *Montaigne devant la Postérité*, pp. 148-75; Boase, *The Fortunes of Montaigne*, pp. 77-103; Busson, *Sources et Développement du Rationalisme*, pp. 456-59, and 585-91, and *La Pensée religieuse française*, esp. pp. 47-48, 52 and 154; Pintard, *Le Libertinage*, pp. 60-61 and 66-67, and Bredvold, *The Intellectual Milieu of John Dryden*, pp. 35-36.

⁵⁶ Cf. note 13.

⁵⁷ Villey, *Sources et Evolution des Essais de Montaigne*, Vol. I, pp. 218 and 365, and Vol. II, pp. 164-65.

to show the inability of human beings to attain knowledge. It is not germane to this study to enter into the controversy regarding the motives of Montaigne in developing and defending the Pyrrhonian view in the *Apologie*, and I will only present those sceptical views which became important through their appearance in this work, regardless of the actual intent of the author in the matter.

Montaigne in his inimitably chaotic manner laid bare the abyss of scepticism, the uncertainty of all knowledge and opinion, even the uncertainty of man's uncertainty. The chief Pyrrhonian themes that are developed are the unreliability of all sense information, our inability to discover a criterion by which to distinguish the true from the false, our inability to demonstrate the truth of any proposition, our hopeless limitation in only being able to be acquainted with the appearances of things, and never being able to comprehend their real natures, the lack of any foundation for our belief in an external world, the lack of rational basis for religious belief, and lastly, that our beliefs are based on psychological and cultural factors and not rational evidence.³⁴ After giving us a vast variety of arguments and illustrations to convince us of these points, Montaigne summed up the Pyrrhonian case near the end of the *Apology*:

Now, since our condition is always adjusting things to itself and transforming them according to its own nature, we no longer know what things are in reality; for nothing comes to us but what is falsified and altered by our sense. . . . The uncertainty of our senses renders everything uncertain that they produce. . . .

To judge of the impressions that we receive from objects, we ought to have a judicatory instrument; to prove the reliability of this instrument we must have a demonstration; to prove the demonstration, an instrument; so here we are, going in a circle! Seeing the senses cannot settle our dispute, being themselves full of uncertainty, it must be reason that is to do it; but no reason can be established without the support of another reason: so here we are, running backwards to infinity. Our conceptions do not attach themselves to external objects, but are formed by the mediation of the senses; and the senses do not take in the external objects, but only their own impressions; and so the conception and the appearance are not of the object, but only of

³⁴ Montaigne, "Apologie de Raymond Sebond," esp. pp. 161-211 and 230-368.

the impression received by the sense, which impression is a different thing from the object. . . .

Both we and our judgment, and all mortal things, are perpetually following and rolling onward. Consequently nothing certain can be established concerning the one by means of the other, both the judging and the judged being in continual motion and mutation.

We have no communication with Being, because all human nature is ever midway between being born and dying, giving only a dim reflection and shadow of itself, and an uncertain and feeble conjecture. And if perchance you fix your thought in a desire to grasp its essence, it would be no more nor less than if one wished to grasp water. For the more you clutch and squeeze that which by its nature flows out on all sides, so the more surely will you lose what you try to grasp and hold.⁵⁹

As a result of this hopeless inability of man to know his universe, Montaigne can only recommend the Pyrrhonian suspense of judgment, and living according to custom and natural inclination, and an acceptance of Christianity on faith alone.

Montaigne's Pyrrhonism and fideism were further popularized by his disciple Pierre Charron in his *De la Sagesse*, and *Les Trois Vérités*, and by Jean-Pierre Camus in his *Essai Sceptique*. This view formed a basic part of the intellectual climate of the *libertinage* of the early 17th century in its scepticism of and freedom from traditional doctrines. Montaigne and Charron were among the best read and most admired thinkers. Their fideism was considered by and large as a serious and acceptable theology in the period 1600-1620.⁶⁰ Later 17th century views such as those of Pascal and Father Malebranche saw Montaigne and Charron as the leading and most dangerous advocates of Pyrrhonism, and ultimately of irreligion.⁶¹

The initial appeal of Montaigne's and Charron's Pyrrhonism

⁵⁹ Ibid., pp. 365-68. (I have used Jacob Zeitlin's translation. Cf. pp. 265-67 of the second volume of his edition of Montaigne).

⁶⁰ Cf. Pintard, *Le Libertinage*, pp. 46 ff. and 60 ff.; and Busson, *Sources et Développement du Rationalisme*, pp. 617-34, and *La Pensée religieuse française*, esp. chap. iv.

⁶¹ Cf. Blaise Pascal, "Entretien avec M. de Saci sur Epictète et Montaigne" in *Pensées et Opuscules*, ed. by Brunschvicg, pp. 146-162; Malebranche, *Recherche de la Vérité*, Book II, Part III, Chap. v, "Du livre de Montaigne."

was largely in terms of its anti-scholasticism, its emphasis on faith and its relativistic view of morality. In the 1620's and thereafter, the more orthodox theologians rose to counter-attack against the pernicious influence of this fideistic Pyrrhonism. Great controversies raged between the followers of Garasse, Boucher, Chanut, Mersenne, Bigot, Yves de Paris, and others fighting the new Pyrrhonism as a form of atheism or libertinism,⁶² and on the other side the defenders, represented by men of such varied backgrounds as St. Cyran, the hero and religious leader of Port-Royal, Léonard de Marandé, an advocate of the new science, and even to some extent, Blaise Pascal.⁶³

While this theological controversy was raging a new *crise pyrrhonienne* arose, due to the collision of the new science and the new Pyrrhonism. The sceptics had cast all in doubt. Montaigne had looked into the abyss of scepticism, and had seen that if the Pyrrhonists could not be refuted, then man could know nothing of reality. The new science, emerging in the 1620's and 30's, pictured a nature written in mathematical characters, a physical machine obeying mathematical laws, a real world to be known through the perfect knowledge of mathematics. But could man really know this world? Could man ever tell if this perfect mathematical universe was a dream of the character of external nature?

The problem of knowledge raised by the new Pyrrhonism reached its full importance after the publication by the Chouets in 1621 of the complete works of Sextus Empiricus in Greek and Latin. (This was the first appearance of the Greek text.) Some of the young intellectuals of the *libertinage* and the era of the new science were attracted to Pyrrhonian scepticism. These new

⁶² On these figures see Boase, *The Fortunes of Montaigne*, Chaps. xiii and xiv; Busson, *La Pensée religieuse française*, pp. 218-24, and Pintard, *Le Libertinage*, pp. 61-74.

⁶³ In 1626 St. Cyran answered Father Garasse's *Somme Théologique*, an attack on Charron, with three massive quarto volumes entitled *Le Somme des Fautes et Faussetés contenues dans la Somme Théologique du Père François Garasse*. St. Cyran only read Charron after being distressed by Garasse's unfair attack. Cf. Boase, *The Fortunes of Montaigne*, pp. 169-70.

On Marandé, see note 14.

On Pascal, see the items listed in note 28.

champions of Pyrrhonism included the priest and professor, Petrus Gassendi, the librarian of Richelieu, Gabriel Naudé, the instructor of the Dauphin, François de La Mothe Le Vayer, the diplomat, François Diodati, and later the learned doctor and translator of the writings of Thomas Hobbes and Sir Thomas More, Samuel Sorbière. These men formed a strong *avant-garde* intellectual movement in the 1620's and 30's. They had their strange *débauches pyrrhoniennes*, and *banquets sceptiques*; strange because they were exclusively intellectual *débauches* and *banquets*. They constituted the *Tétrade*, which for a time formed the leading spirit of the *libertinage érudit* of the first half of the 17th century. For the *Tétrade* the work of Sextus Empiricus was what Le Vayer called "our decalogue," and "a divine book."⁴⁴

The challenge of the *Tétrade*, especially that of Gassendi, was met at first by their friends Father Mersenne and Lord Herbert of Cherbury and even by their leader Gassendi, and finally by their determined enemy René Descartes. The new Pyrrhonian challenge was seen as not just that of the older fideistic Pyrrhonism attacking orthodox or scholastic Catholicism, or an ethical relativism against a rigid moral system (though these elements were certainly involved, especially in Naudé's and Le Vayer's works). The intellectual climate created by Pyrrhonism was seen in a new perspective, as an attack that struck to the roots of all human knowledge, and in particular the new knowledge that man would find in the new science.

The new Pyrrhonists, the *Tétrade*, were not enemies of the new science. Far from it. They advocated this new way of understanding the world, only doubting that this approach could penetrate beyond information about the apparent qualities of things to their inner or real natures. They doubted that this new science, restricted to appearances, could ever be shown to have an ultimate foundation or be known to be true.

⁴⁴ This group is discussed in detail in Pintard, *Le Libertinage*, Part II, pp. 125-434; also in Perrens, *Les Libertins*, esp. pp. 114 ff.; Denis, *Sceptiques ou Libertins*, pp. 5-57; and Adam, *Histoire de la Littérature française*, Part II, Chap. ii. These "strong" remarks of La Mothe Le Vayer appears throughout his *Cinq Dialogues d'Orasius Tubero*, e.g. pp. 20, 21, 30, 34, 111, 114, 125, 144, and 288.

The leader of this movement, Petrus Gassendi, 1592-1655, was a priest who rose very rapidly in the 17th century world. He began teaching at 16, was appointed Lecturer in Theology at Digne in 1612, Lecturer in Philosophy at Aix in 1616, then canon of Grenoble, Provost of the Digne Cathedral in 1633, and Professor of Mathematics at the Collège Royal in Paris in 1645. He is best remembered, if at all, for his revival of Epicurean atomic physics. His physical theory rivalled that of Descartes in the mid-17th century. What is forgotten or unknown about Gassendi is his early advocacy of Pyrrhonism. (Lenoble's recent study of Mersenne deals in great detail with Gassendi but never mentions his scepticism. He is treated only as a materialistic scientist.⁶⁵) Pierre Bayle credits Gassendi with having introduced the thought and name of Sextus Empiricus into modern philosophy.⁶⁶ In 1621 Gassendi wrote to friends that Sextus was his master, and that he was an "almost Pyrrhonian."⁶⁷ Using sceptical arguments, he began an anti-Aristotelian crusade. His first work, his *Exercitationes Paradoxicæ adversus Aristotelos*, 1624 and continued in 1627, attacks the basic structure of Aristotle's philosophy. Gassendi tried to show that no knowledge is possible, least of all Aristotelian knowledge, and that it must be concluded that *nihil sciri*, nothing can be known. The sole philosophy that can profit man, Gassendi reported, is that of the Pyrrhonians, who wisely

⁶⁵ E.g. see Lenoble, *Mersenne*, pp. 12, 28-29, and the many other references to Gassendi and his doctrines.

Gaston Sortais, in his *La Philosophie moderne depuis Bacon jusqu'à Leibniz*, Vol. II (Paris, 1922), pp. 252-57, tried to defend Gassendi against the charge of Pyrrhonism, a canard he attributed to Bayle and Voltaire. The evidence offered relates primarily to Gassendi's later writings which are definitely non-Pyrrhonian. Also, I believe, Sortais misrepresented the classical sceptic position as one of complete denial or despair of finding the truth. In this sense of "sceptic" Gassendi was not one.

⁶⁶ Bayle, *Dictionnaire*, Vol. XII, art. "Pyrrhon," Rem. B, p. 102.

⁶⁷ Gassendi, *Opera Philosophica* (Florence, 1727), Vol. VI, p. 361, letter to Henry Faur.

The same sentiments appear in a letter to Mersenne of Feb. 4, 1629, in *Correspondance du P. Marin Mersenne*, pub. by Mme. Paul Tannery, ed. by De Waard et Pintard (Paris, 1933-46), Vol. II, p. 185, and the editorial comments on this on p. 200; and in a letter of June 15, 1629, in *Lettres de Peiresc*, Vol. IV (Paris, 1893), ed. by P. T. de Larroque, in *Collection de Documents inédits sur l'Histoire de France*, pp. 195n-196n.

saw that all was in doubt concerning the nature of reality, and that man was only able to know appearances, which provided no clue as to the nature of a real external world, since appearances varied and we had no criterion for judging veridical appearances, or those that came from real objects. Honey might seem sweet to us and fire might seem hot to us and snow might seem white to us, but how could we ever be sure that these properties belong to objects as they really exist apart from how they appear to us? The "real" world is hidden from us and we have no basis for judging what it may be like from what we perceive. The arguments that Gassendi offered were essentially those appearing in Sextus Empiricus, especially the famous ten tropes and the problem of the criterion.⁴⁸

The use of Pyrrhonian arguments against Aristotelianism had occurred earlier in the works of Cornelius Agrippa and the younger Pico della Mirandola.⁴⁹ But Gassendi concentrated his attack more exclusively on the problem of knowledge than his predecessors had. Gassendi was not merely a humanist scoffing at the complexities and trivialities of scholasticism. He was not attacking the bases of Aristotelianism and any theory of knowledge at a time when technical philosophy was in disrepute, but rather when a serious attempt was being made to reimpose Aristotelian teachings. (In 1625 the learned doctors of Paris condemned the teaching of non-Aristotelian physics.) Gassendi also was not ignorant of the scientific developments of the time as Montaigne was. He was already making his mark in the development of the mechanical theories of the time. Hence, Gassendi realized the importance of his Pyrrhonian challenge. In reality *nihil sciri*. The best one could do was describe the world of appearances, and abandon any attempt to find a real world beyond appearances, a world of metaphysical entities. No bridge can be found between the science of appearances and a realm of truth.

René Pintard summarized Gassendi's scepticism of his *Exercitationes* as follows:

He attacks not only Aristotelian dialectic, but all dialectic; not only

⁴⁸ Gassendi, *Exercitationes*, esp. Preface and Book II, Exercitatio VI, pp. 92-98 and 177-93.

⁴⁹ Cf. the references in note 54.

Aristotelian physics, but all physics; not only Aristotelian metaphysics, but all metaphysics, not only Aristotelian ethics, but all ethics. *Nihil sciri*. He has made this his Pyrrhonian principle and he tries to establish it, by demonstrating the feebleness and uncertainty of the human sciences, whatever they may be.⁷⁰

This type of scepticism with regard to human knowledge had great effects. It caused a sensation at the time.⁷¹ Two serious attempts to erect a basis for knowledge, to find the criterion of truth, appeared almost simultaneously with Gassendi's work, one by Lord Herbert of Cherbury, *De Veritate*, 1624, the other by Father Marin Mersenne, *La Vérité des Sciences, contre les Septiques ou Pyrrhoniens*, 1625. Both of the authors, in spite of their vehement antiscepticism, were good friends of Gassendi. Gassendi was perhaps Mersenne's closest companion, though Le Vayer and Naudé were also very close to him. Even after Mersenne became the intimate of that most violent hater of scepticism, René Descartes, he still preserved his friendship with the members of the *Tétrade*.⁷² Lord Herbert left fewer clues as to his friends or enemies. He completed *De Veritate* while he was the English Ambassador in Paris. In it and in his *Autobiography* he gives no clues as to whom he was attacking or who were his philosophical friends in Paris. At a later date there is evidence that he was a good friend of Gassendi's, sending him a copy of *De Veritate*, which Gassendi criticized from a sceptical point of view, and paying a visit to Gassendi in his last years.⁷³

De Veritate, Lord Herbert stated in the preface, is an answer to two sorts of thinkers, those who say everything can be known, and those who say nothing can be known. The attempt of *De Veritate* is to discover the criterion for discerning truth and the method of finding truth.⁷⁴ In order to carry on this inquiry it is

⁷⁰ Pintard, *Le Libertinage*, p. 479.

⁷¹ Cf. P. F. Thomas, *La Philosophie de Gassendi* (Paris, 1889), Chap. i, p. 9.

⁷² Lenoble, *Mersenne*, pp. 58, 193-95, and 449.

⁷³ Edward, Lord Herbert of Cherbury, *De Veritate*, trans. with introduction by Meyrick H. Carré (Bristol, 1937), p. 12; and Petrus Gassendi, letter to Lord Herbert of Cherbury, in *Opera Philosophica* (Florence, 1727), pp. 377-84.

⁷⁴ Herbert of Cherbury, *De Veritate*, pp. 71-82.

first necessary to assert that "Truth Exists." "The sole purpose of this proposition," Lord Herbert stated, "is to assert the existence of truth against imbeciles and sceptics."⁷⁵ The problem of truth involves four components, the truth of things as they really are in themselves (*veritas rei*), the truth of things as they appear to be to us (*veritas apparentiae*), the truth of the concepts that we form of things (*veritas conceptus*), and lastly, the ultimate criterion, our Common Notions or innate ideas by which we judge our concepts (*veritas intellectus*). Lord Herbert admitted the Pyrrhonian contention that the truth of things-in-themselves, the real natures, is hidden from us. All we can know of the real natures are that they are unchangeable and absolute.⁷⁶ The core of the difficulty in finding truth is in establishing a standard by which to judge whether the apparent truths and the concepts which we form of things conform to the real nature of things. Lord Herbert tried to establish a set of conditions for evaluating the truth of appearances, and here he largely follows Aristotle on the conditions of perception.⁷⁷ The real issue, or the central problem of knowledge, is how can we tell when the concepts that we form of things conform to the real natures of things? How do we know that our concepts are not illusory and unrelated to the real world, and that we are not left in the sceptical plight of complete inability to grasp the truth of things as they really are? Lord Herbert's solution is to offer a new criterion for judging the truth of concepts—the Common Notions present in all normal men. These Common Notions are to be found by means of the common consent or universal agreement of all men. What we all accept innately are the Common Notions. When we have found these by appealing to what notions are actually universally accepted by all men, then we have the criterion to judge the truth of concepts. Concepts are evaluated by seeing if they conform to the Common Notions, and thereby we can judge if our concepts are adequate for knowledge of things as they really are. Hence, through the Common Notions we can bridge the gap between our

⁷⁵ Herbert of Cherbury, *De Veritate*, p. 83.

⁷⁶ *Ibid.*, pp. 83-90.

⁷⁷ *Ibid.*, pp. 90-102.

subjective ideas and the true nature of things, and through our adequate concepts, and the conditions of perception, relate the world of appearances to the world of things."⁷⁸

Lord Herbert's theory has fallen into great notoriety due to John Locke's severe criticism in Book I of the *Essay on Human Understanding* of the doctrine of innate ideas based on universal consent.⁷⁹ An answer from a sceptical point of view was given by Gassendi in his letter to Lord Herbert in 1647. (The criticism had been worked out in 1634.⁸⁰) Gassendi tried to show that appearances provided no clue as to the truth of things in themselves, and that any attempt to go beyond appearances displayed an unfortunate temper of mind. Common Notions provided no criterion of truth because there really was no lasting universal agreement on anything, and in view of the diversity of opinion there is no reason to expect that what one believes must be true. The only view of Lord Herbert that Gassendi could accept was that the inner nature of things was completely hidden from us. Gassendi then insisted that all of Lord Herbert's machinery of types of truth, conditions of truth, Common Notions, etc., would help not one iota since we still had no way of telling when our concepts and appearances related to or conformed to the real world.⁸¹

(To be concluded)

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⁷⁸ Herbert of Cherbury, *De Veritate*, pp. 103-07 and 115-45.

⁷⁹ John Locke, *An Essay Concerning Human Understanding*, ed. by A. C. Fraser (Oxford, 1894), Vol. I, Book I, Chap. i, Part 2 ff., pp. 38 ff.

⁸⁰ Cf. Pintard, *Le Libertinage*, p. 481. Pintard refers to an unpublished letter to Diodati of August 29, 1634. Sidney Lee, in his edition of *The Autobiography of Edward, Lord Herbert of Cherbury* (London, n. d. [apparently 1906 or 1907]), p. xxxv, dates Herbert's giving of a copy of *De Veritate* to Gassendi as 1643.

⁸¹ Gassendi, *Letter to Lord Herbert*, pp. 377-84. See also Pintard, *Le Libertinage*, pp. 481 ff.

ANNOUNCEMENTS

THE Escuela Superior Peronista makes this announcement: "The Peronist School of High Studies received from General Perón, (on) the day of its inauguration, a fundamental directive: develop and keep up to date the Peronist Doctrine. Accomplishing . . . this honorable mission, the school intends to publish monthly a Review of Justicialist Studies (*Revista de Estudios Justicialistas*), where peronist research men give a scientific exposition of the main principles." The magazine will be edited by Dr. Rual A. Mende, Director of the Peronist School. Subscription information may be obtained from him at San Martin 665, Buenos Aires.

We learn from Professor Risieri Frondizi that Professor Francisco Romero, the leading Latin American philosopher, has been imprisoned by the Perón government.

The Fifth Annual Meeting of the New Mexico Philosophical Society was held on May 2-3, 1953 in Socorro, New Mexico. Papers were presented by Hubert G. Alexander, Walter Drost-Hansen, Maylon H. Hepp, Howard E. Sylvester, and Jaime Velez.

The Institute for the Unity of Science held a meeting at New York University on May 24, 1953. The meeting was devoted to discussion of the connection between induction and probability. Papers were read by Jacob Bronovsky, John Freund, John Kemeny, and Douglas McGee.

William H. Werkmeister, Professor in the University of Nebraska, has been appointed Professor of Philosophy at the University of Southern California to succeed retiring Professor Paul R. Helsel.

Professor Carl G. Hempel of Yale University and Professor Charles L. Stevenson of the University of Michigan will be visiting lecturers at Harvard University during the academic year 1953-54.

Publication has been announced of the first regular issue of *Theology Digest*. Rev. Gerald Van Ackern, S. J. is the editor of the magazine. His office is at St. Mary's College, St. Louis University, St. Mary's, Kansas.

ERRATA

The following correction should be made in Raphael Demos' "Nature, Mind and Death," published in this journal in June 1953. Line 22 on page 577 of that article should be replaced by "own example. I hope Mr. Ducasse will not mind."

The following corrections should be made in N. A. Nikam's "Indian Philosophy: A Note on Some Characteristics," published in this journal in June 1953. On p. 667, line 28: read "or" for "of"; on p. 668, line 21: read "coming to be" for "ceasing to be"; and on p. 673, line 14: interchange "aparāvidya" and "parāvidya."

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